Allen-Bradley

160 SSC™ Variable Speed Drive (Series C)

Publication 160-CDP

Configured Drive Package

Rockwell Automation

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. " *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls*" (Publication SGI-1.1 available from your local Allen-Bradley Sales Office or online at **http://www.ab.com/manuals/gi**) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will the Allen-Bradley Company be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, the Allen-Bradley Company cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Allen-Bradley Company with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual we use notes to make you aware of safety considerations.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

Attentions help you:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is especially important for successful application and understanding of the product.

Shock Hazard labels may be located on or inside the drive to alert people that dangerous voltage may be present.

SCANport is a trademark of Rockwell Automation.
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IBM is a registered trademark of International Business Machines Corporation.
Windows 95 is a registered trademark of Microsoft Corporation.

Bulletin 160 SSC™ Variable Speed Controller Configured Drives Package

Thank you for purchasing a Bulletin 160 Configured Drive. This Rockwell Automation product is designed with the customer in mind, saving time and money by configuring a drive package at the factory to meet your application needs.

This publication contains all drawings for the Bulletin 160 Configured Drive product offering. To select the appropriate schematics for the Configured Drive you have purchased, obtain the complete catalog string from the unit's data nameplate. Note the options specified in the catalog string and refer to the page number that corresponds with each option.

Compliance Certification (applicable to approved program defined options)

U.S./Canada	UL:	UL508C
	CUL:	CAN/CSA-C22.2 No. 14-M91
Europe	CE:	Low Voltage Directive – EN60204-1, EN50178 EMC Directive – EN61800-3, EN500082-2, EN50081-2
Australia	C-Tick:	AS/NZS 2064.1

CE Compliance

CE Marking of this product is based upon compliance with the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. The following standards have been used to demonstrate compliance with the directives:

Low Voltage Directive	EN60204-1 EN50178
EMC Directive	EN61800-3 EN50081-2 EN50082-2

Important: This product complies with the EMC requirements of EN61800-3 and other referenced EMC standards as a stand-alone unit. It is the responsibility of the machine builder applying this product in machinery to ensure EMC compliance of the entire installation. Refer to the Bulletin 0160 User Manual for additional information.

A copy of the Declaration of Conformity (DoC) is available from your local Rockwell Automation Sales Office.

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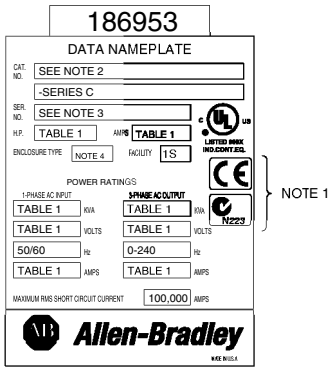
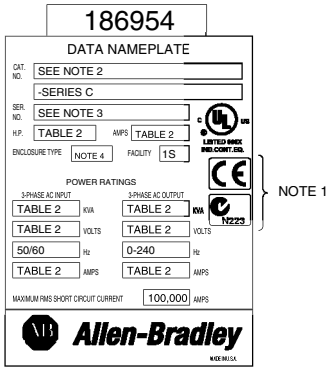
Data Nameplate Drawing



SINGLE PHASE DATA NAMEPLATE

NOTE 1



THREE PHASE DATA NAMEPLATE

NOTE 1

TABLE 1

SINGLE PHASE

DRIVE RATINGS

CATALOG NO.	H.P.	INPUT KVA	INPUT VOLTS	INPUT AMPS	OUTPUT KVA	OUTPUT VOLTS	OUTPUT AMPS
160S-AA02*	.5	1.1	230	4.8	0.5	230	2.3
160S-AA03*	.75	1.4	230	6.2	0.7	230	3.0
160S-AA04*	1	2.2	230	9.4	1.0	230	4.5
160S-AA08*	2	3.7	230	16.3	1.8	230	8.0

TABLE 2

THREE PHASE

DRIVE RATINGS

CATALOG NO.	H.P.	INPUT KVA	INPUT VOLTS	INPUT AMPS	OUTPUT KVA	OUTPUT VOLTS	OUTPUT AMPS
160-AA02*	.5	1.1	230	2.8	1.0	230	2.3
160-AA03*	.75	1.4	230	3.6	1.2	230	3.0
160-AA04*	1	2.2	230	5.4	1.9	230	4.5
160-AA08*	2	3.7	230	9.4	3.3	230	8.0
160-AA12*	3	5.7	230	14.2	5.0	230	12.0
160-AA18*	5	8.4	230	21.1	7.2	230	18.0
160-BA01*	.5	1.1	460	1.4	1.0	460	1.2
160-BA02*	.75	1.6	460	2.0	1.3	460	1.7
160-BA03*	1	2.2	460	2.8	1.8	460	2.3
160-BA04*	2	3.7	460	4.6	3.2	460	4.0
160-BA06*	3	5.6	460	7.0	4.8	460	6.0
160-BA10*	5	9.7	460	12.2	8.4	460	10.5

* - CATALOG SUFFIX MUST CONTAIN "SF1" OR "PS1".

NOTES:

1.) CE AND C-TICK LABELS CAN NOT BE USED WITH OPTION LTN120.
2.) ASSIGN CATALOG NUMBER PER THE ITEM DESCRIPTION.
3.) TO ASSIGN SERIAL NUMBER USE PARENT ITEM NUMBER FOLLOWED BY A (-1), (-2), ETC. DEPENDING ON QUANTITY OF ORDER ITEM.
4.) ENCLOSURE TYPE IS DICTATED BY 2 DIGITS OF THE DRIVE CATALOG NUMBER.
a.) "AF" = TYPE 4
b.) "AS" = TYPE 4X
5.) KVA AND CURRENT RATINGS ARE BASED ON A NOMINAL VOLTAGE OF 230V AND 460V RESPECTIVELY.

Standard Control Interface

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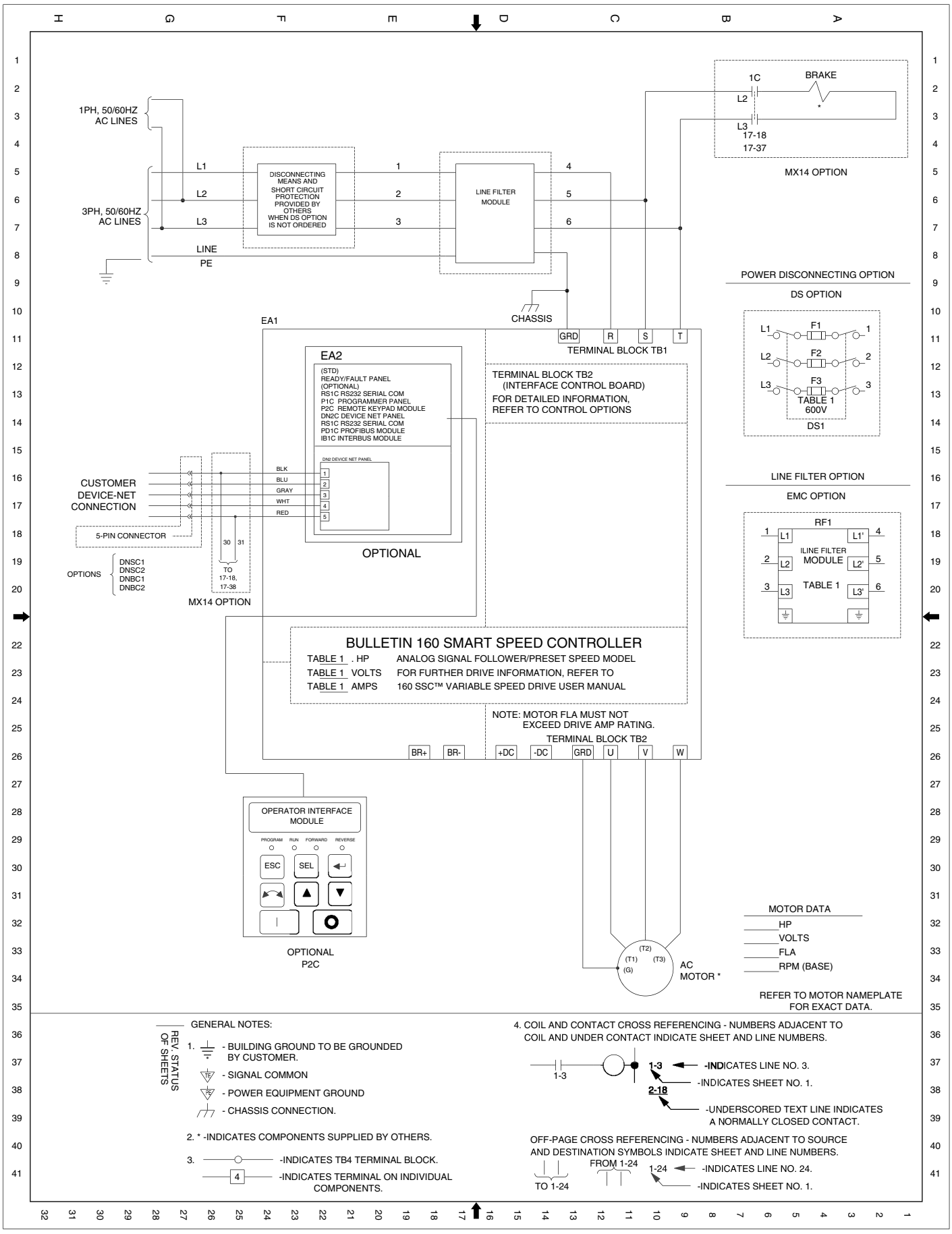
Power Distribution and DS Option



Drive Ratings and DS Option Ratings

TABLE 1

SINGLE PHASE

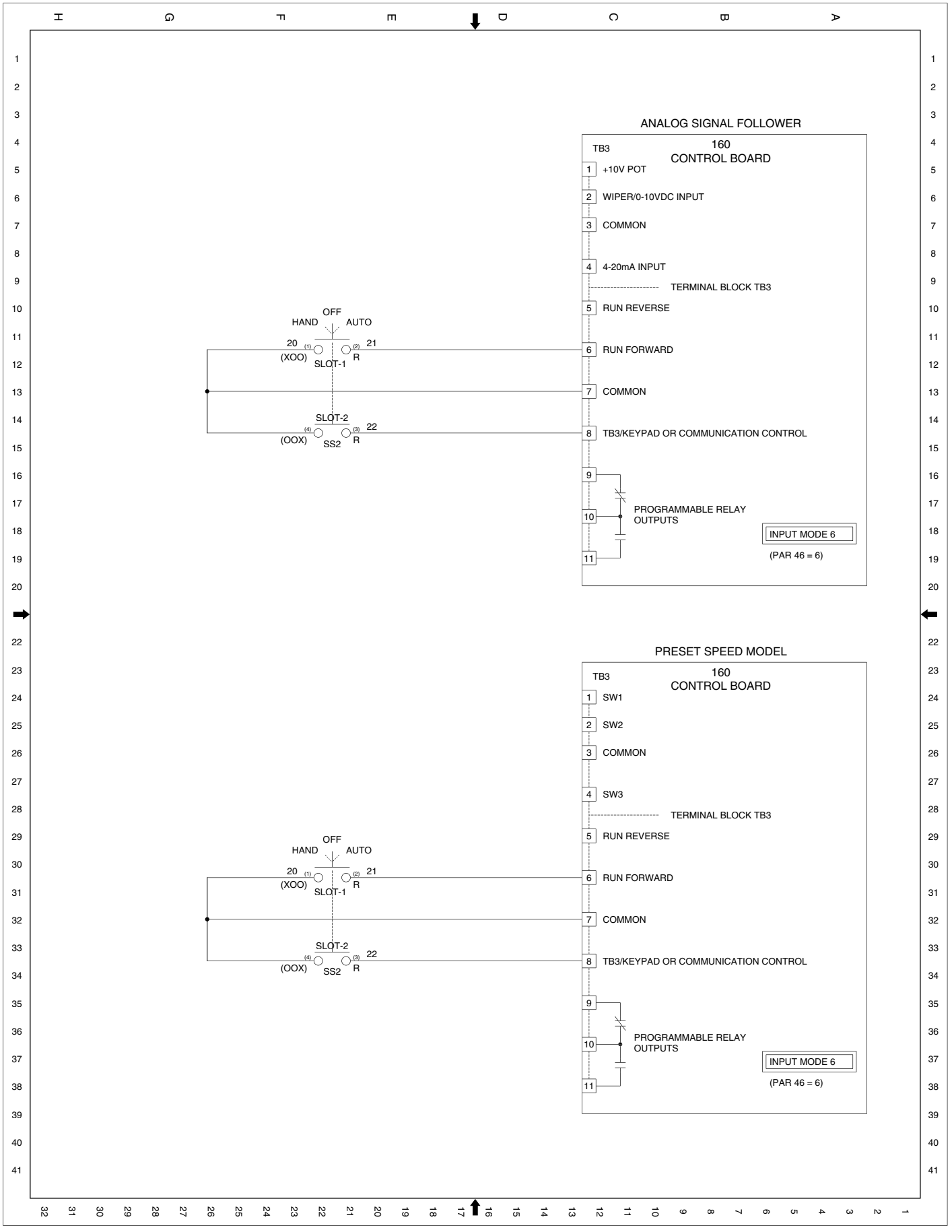
DRIVE RATINGS CATALOG NO. (HP)	VOLTAGE	FLA	FUSE RATINGS (DS OPTION) TYPE	AMP	VOLT	LINE FILTER MODULE CATALOG NUMBER
160S-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V	160S-RFA-9-A
160S-AA03* (.75)	200-240V	3.0A	LPJ	10A	600V	160S-RFA-9-A
160S-AA04* (1)	200-240V	4.5A	LPJ	15A	600V	160S-RFA-9-A
160S-AA08* (2)	200-240V	8.0A	LPJ	30A	600V	160S-RFA-16-B

THREE PHASE

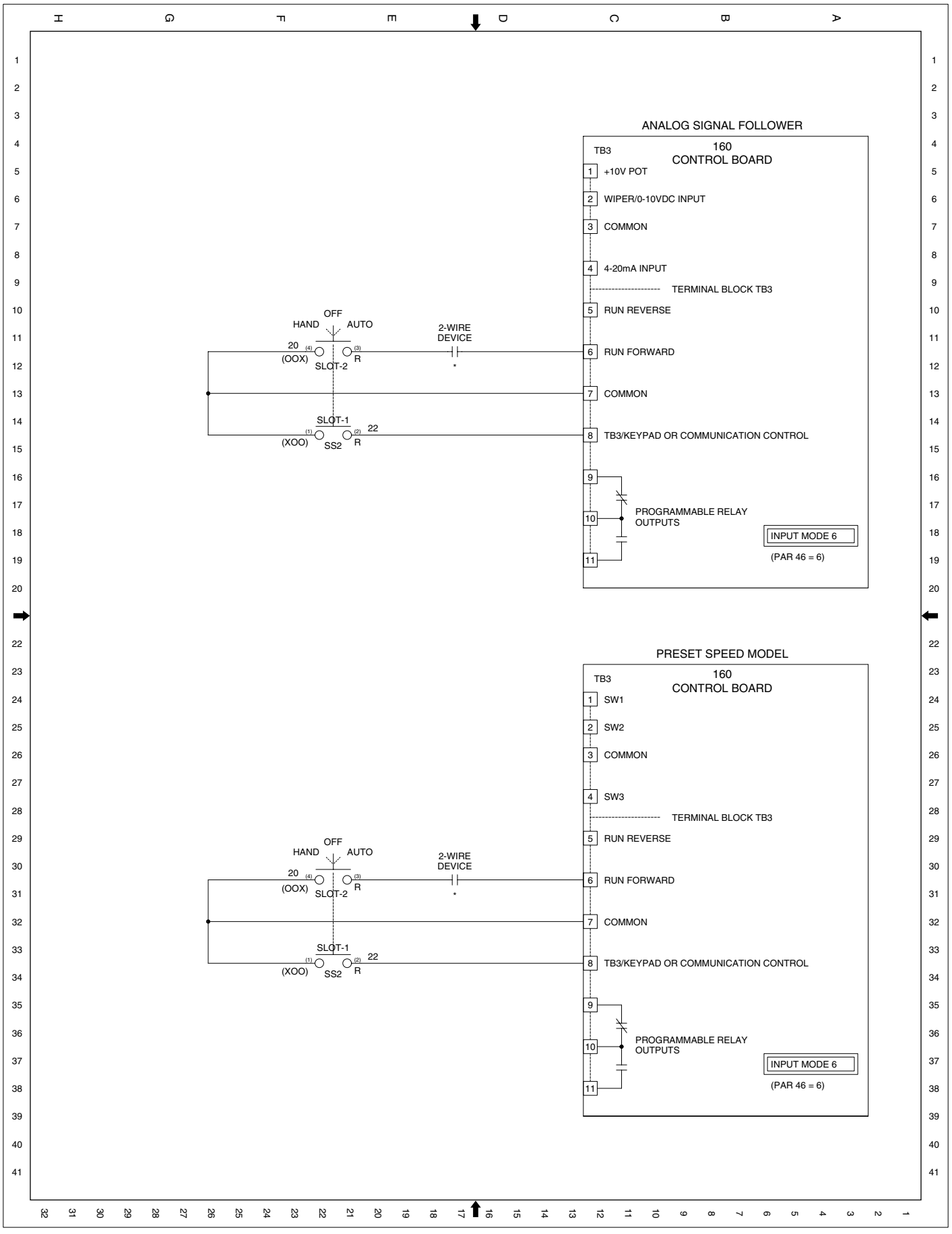
DRIVE RATINGS CATALOG NO. (HP)	VOLTAGE	FLA	FUSE RATINGS (DS OPTION) TYPE	AMP	VOLT	LINE FILTER MODULE CATALOG NUMBER
160-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V	160-RFB-5-A
160-AA03* (.75)	200-240V	3.0A	LPJ	6A	600V	160-RFB-5-A
160-AA04* (1)	200-240V	4.5A	LPJ	10A	600V	160-RFB-5-A
160-AA08* (2)	200-240V	8.0A	LPJ	15A	600V	160-RFB-14-A
160-AA12* (3)	200-240V	12.0A	LPJ	20A	600V	160-RFB-14-A
160-AA18* (5)	200-240V	18.0A	LPJ	30A	600V	160-RFB-22-B
160-BA01* (.5)	380-460V	1.2A	LPJ	4A	600V	160-RFB-5-A
160-BA02* (.75)	380-460V	1.7A	LPJ	4A	600V	160-RFB-5-A
160-BA03* (1)	380-460V	2.3A	LPJ	5A	600V	160-RFB-5-A
160-BA04* (2)	380-460V	4.0A	LPJ	8A	600V	160-RFB-5-A
160-BA06* (3)	380-460V	6.0A	LPJ	15A	600V	160-RFB-14-A
160-BA10* (5)	380-460V	10.5A	LPJ	20A	600V	160-RFB-14-B

* - CATALOG NO. SUFFIX CAN CONTAIN "SF1" OR "PS1"

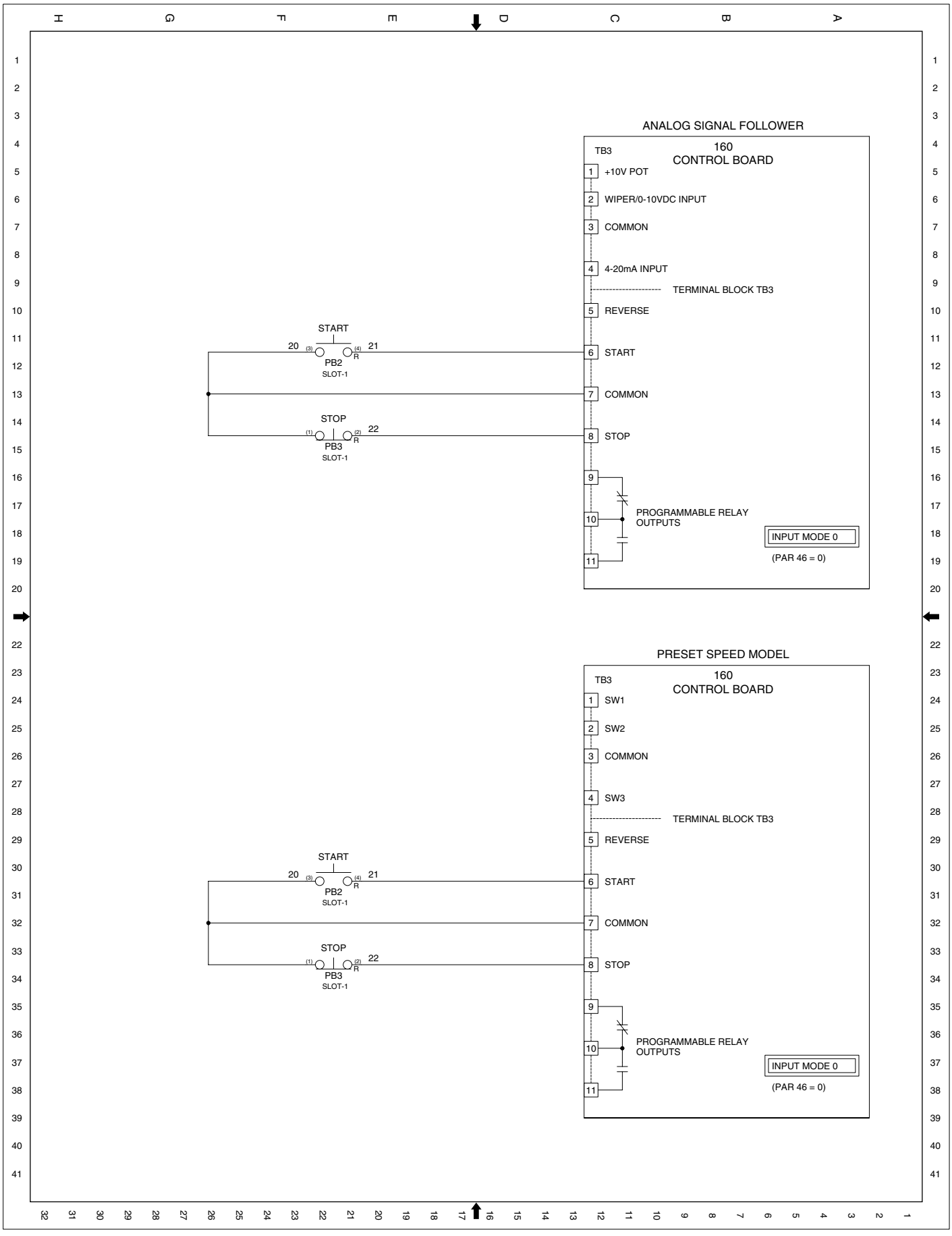
D13 Without P2C



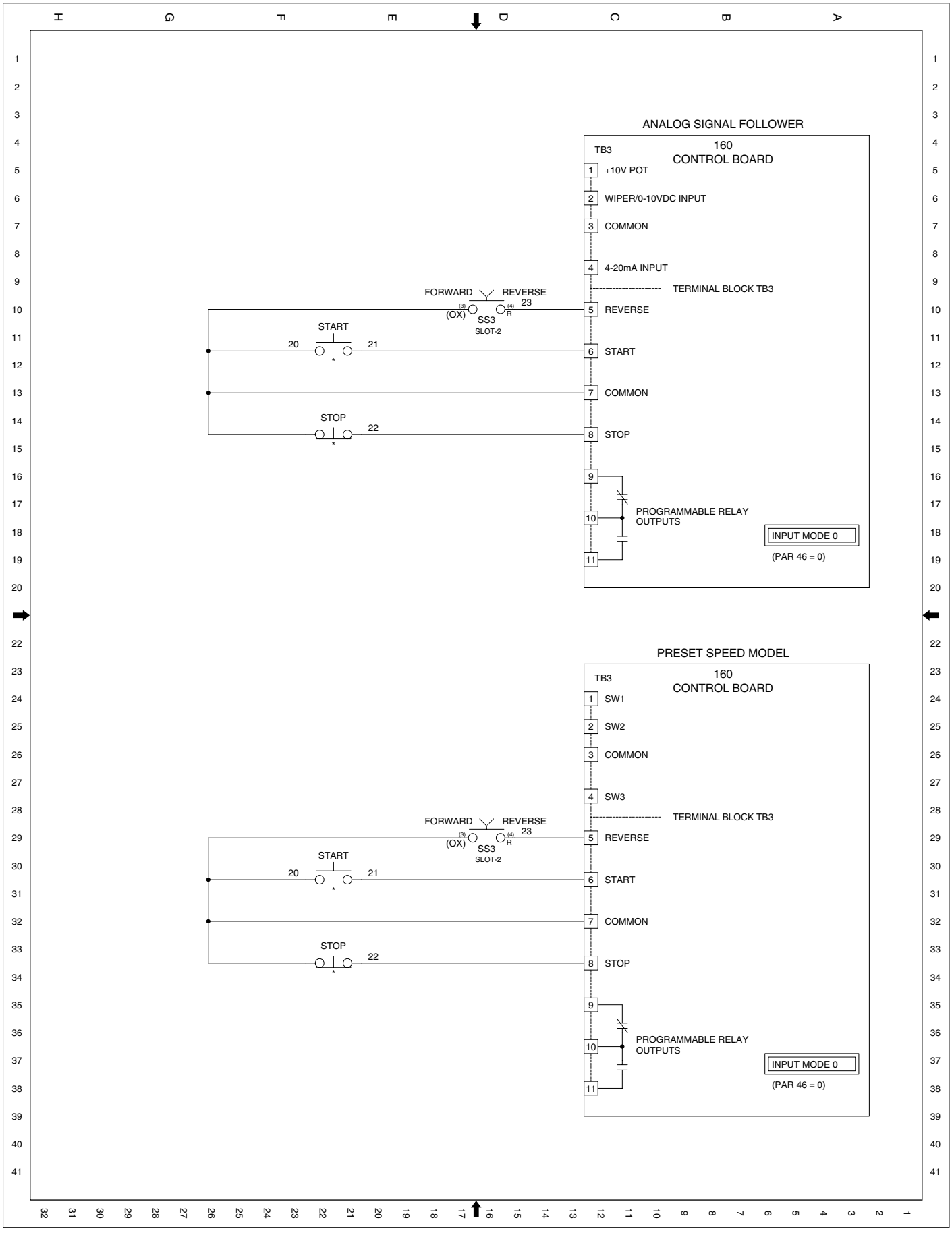
D13 With P2C


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
OFF
HAND
AUTO
20
(OOX)
SLOT-2
R
2-WIRE DEVICE
SLOT-1
(XOO)
SS2
22
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)

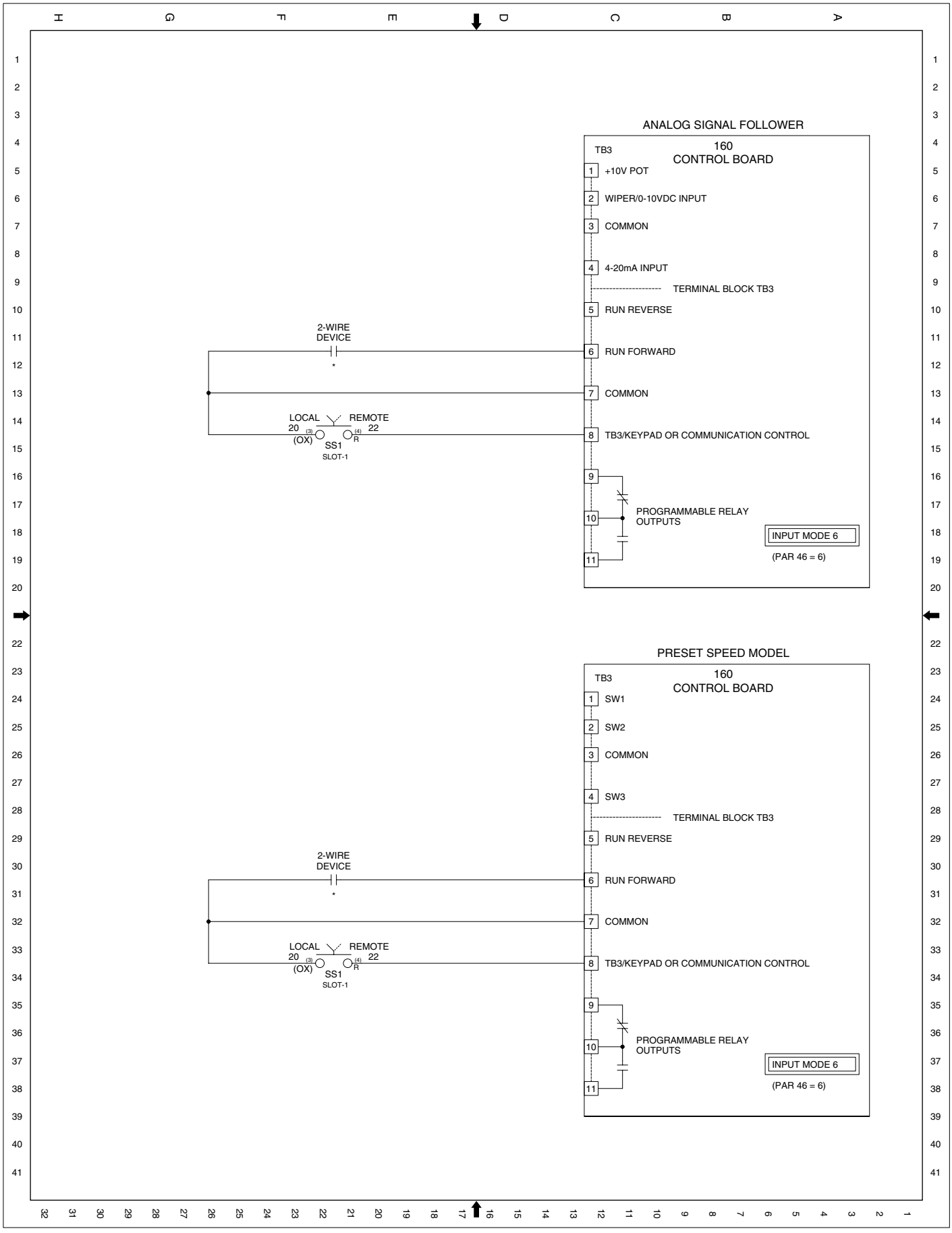
D17


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
START
20 (3) (4) 21
R
PB2
SLOT-1
STOP
(1) (2) 22
R
PB3
SLOT-1
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
START
20 (3) (4) 21
R
PB2
SLOT-1
STOP
(1) (2) 22
R
PB3
SLOT-1

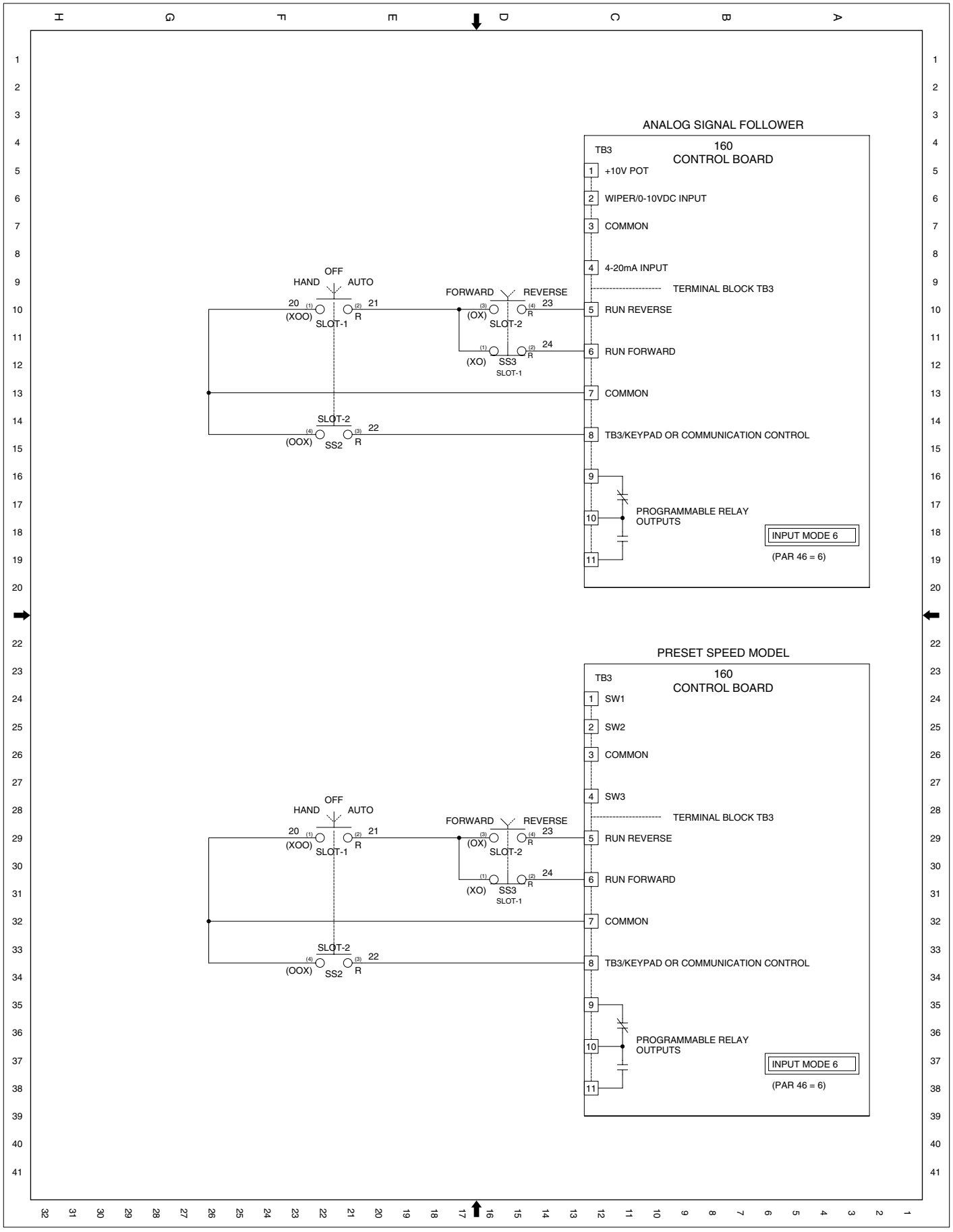
D32


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
FORWARD
REVERSE
23
(3) (OX)
(4) R
SS3
SLOT-2
START
20
21
STOP
22
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
FORWARD
REVERSE
23
(3) (OX)
(4) R
SS3
SLOT-2
START
20
21
STOP
22

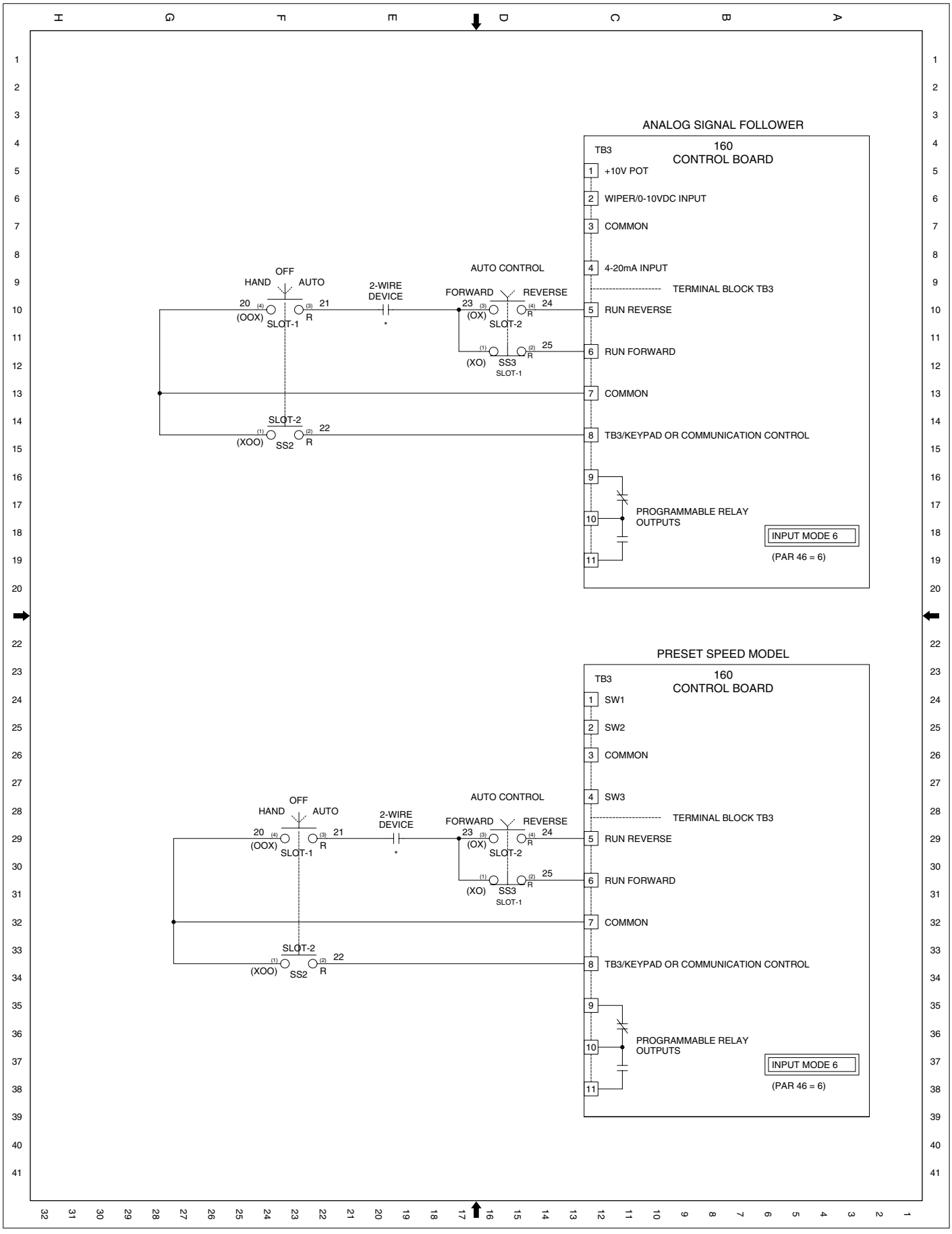
D33


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)
2-WIRE DEVICE
*
LOCAL
REMOTE
20 (3) (OX)
(4) 22 R
SS1
SLOT-1
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)
2-WIRE DEVICE
*
LOCAL
REMOTE
20 (3) (OX)
(4) 22 R
SS1
SLOT-1

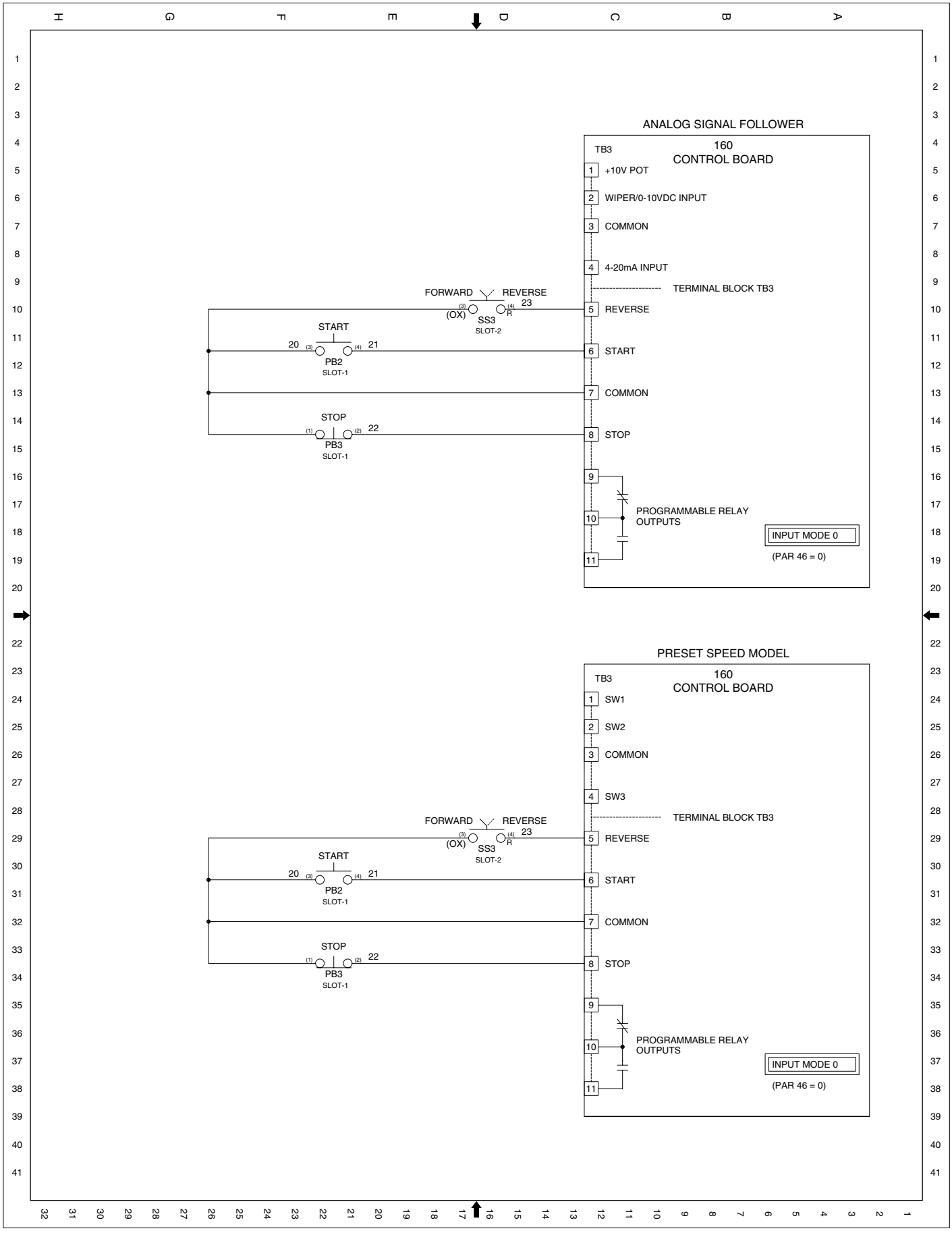
D13 and D32 Without P2C



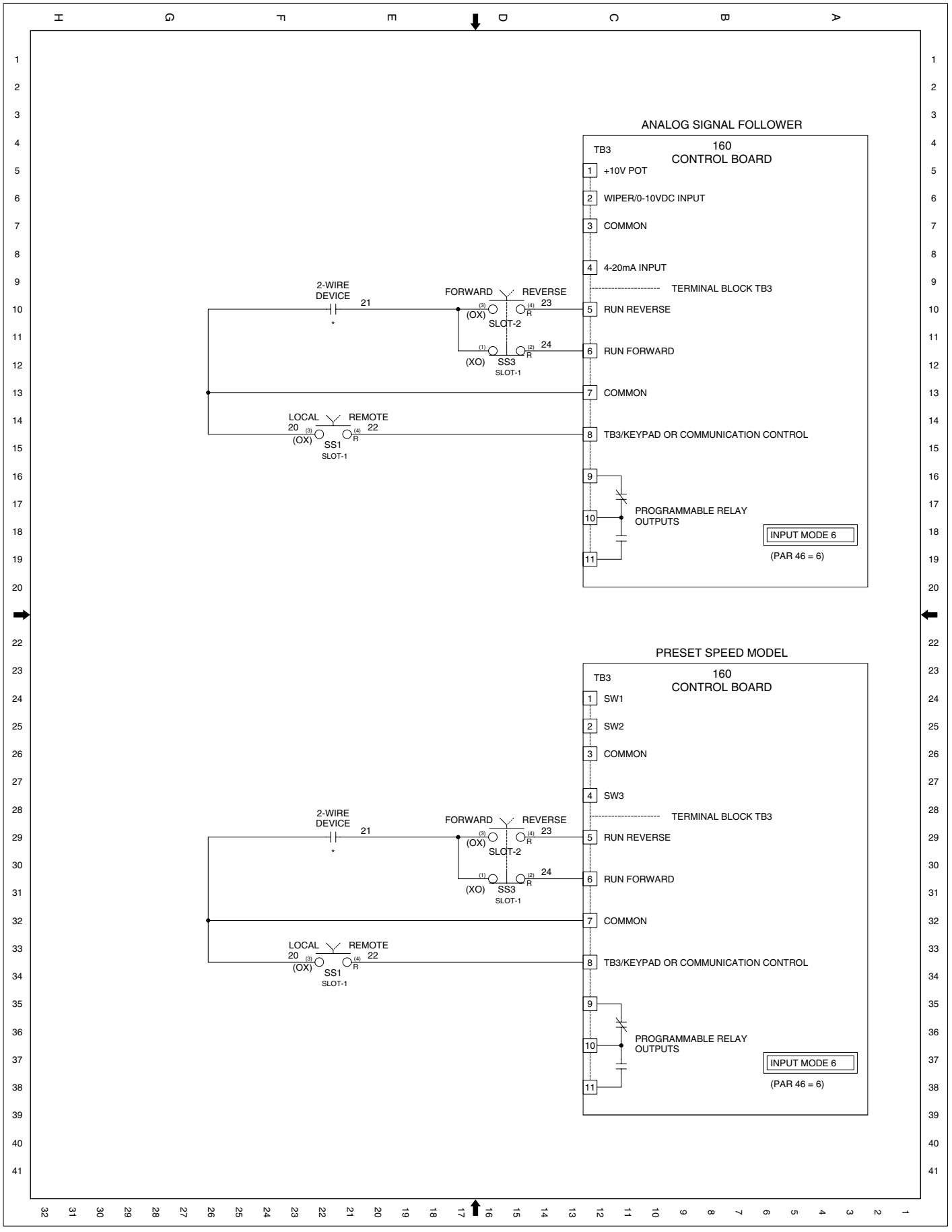
D13 and D32 With P2C



D17 and D32


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
FORWARD
REVERSE
(OX)
SS3
SLOT-2
23
START
20
21
PB2
SLOT-1
STOP
22
PB3
SLOT-1
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)

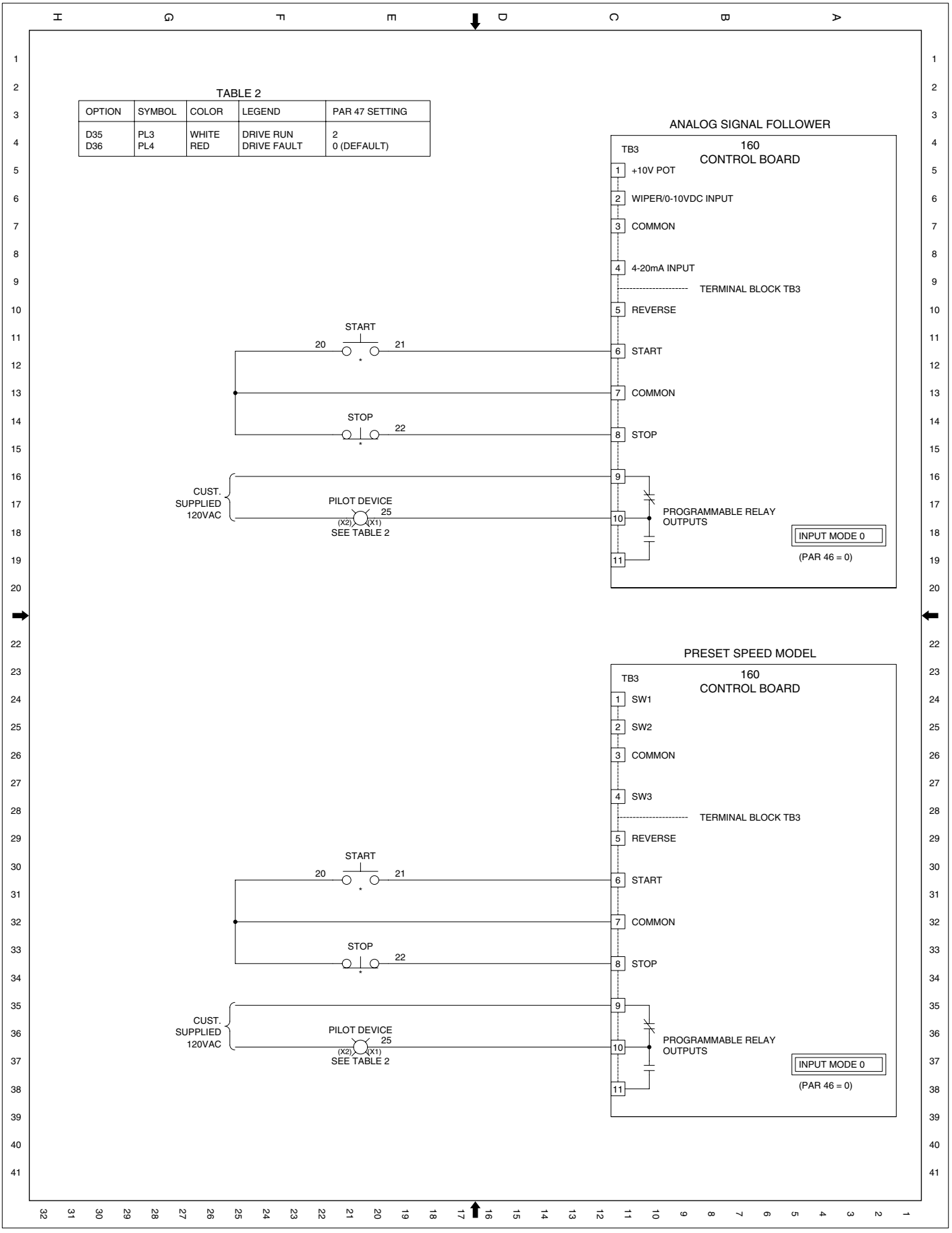
D32 and D33


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)
2-WIRE DEVICE
21
*
FORWARD
REVERSE
23
(OX)
SLOT-2
24
(XO)
SS3
SLOT-1
LOCAL
REMOTE
20
22
SS1
SLOT-1
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)

D35 and D36 Without Keypad or Comm Control Options

TABLE 2

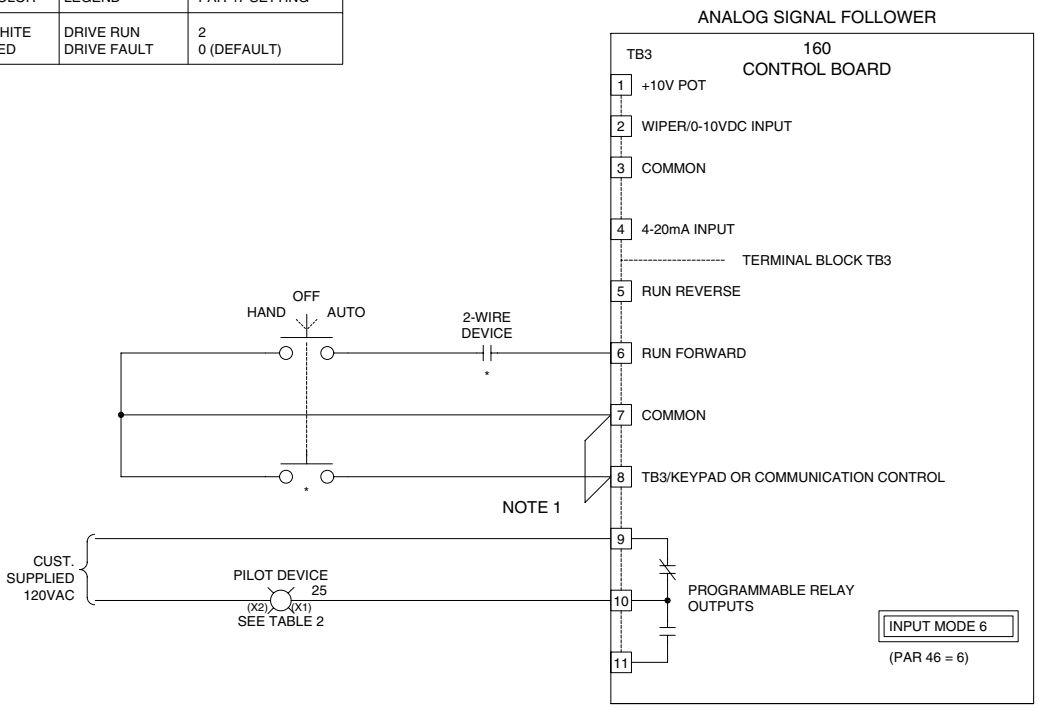
OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)

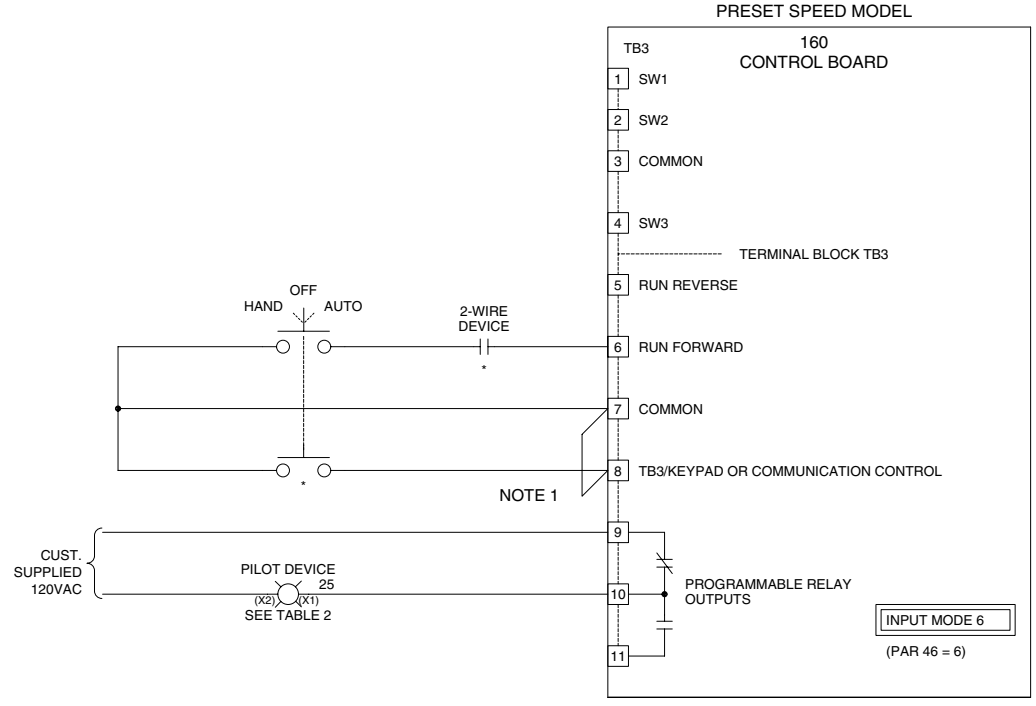


D35 and D36 With Keypad or Comm Control Options

TABLE 2

OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)

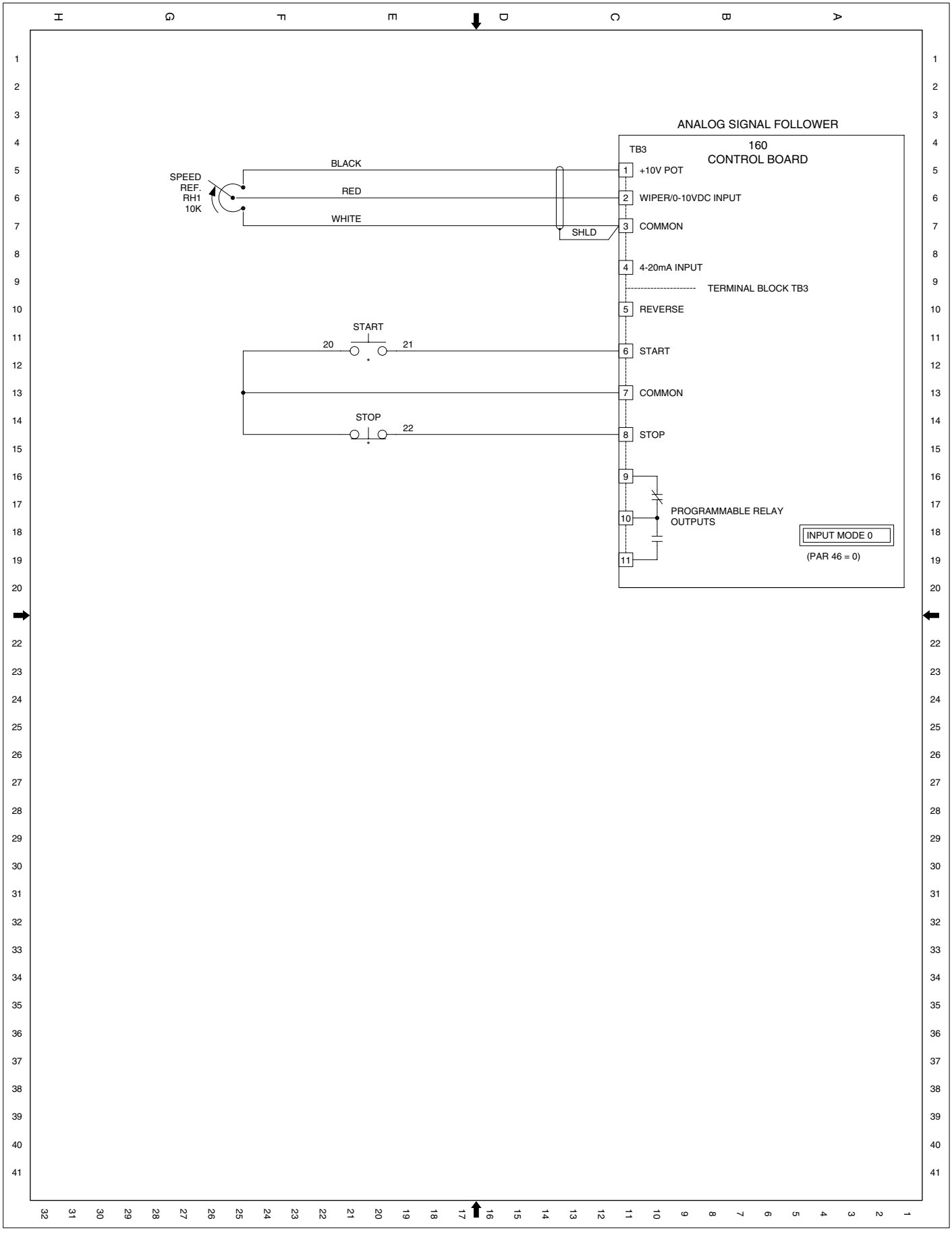




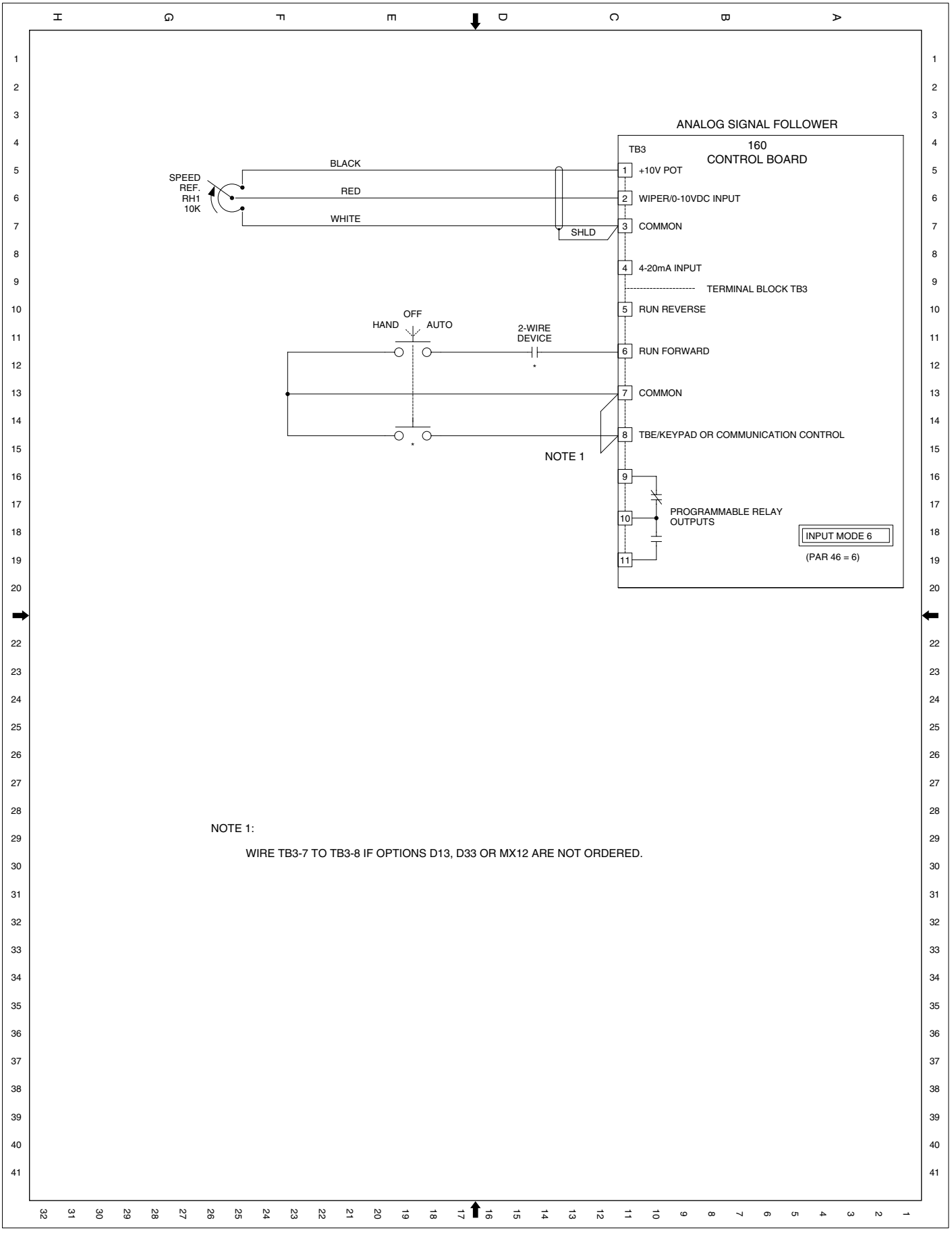
NOTE 1:

WIRE TB3-7 TO TB3-8 IF OPTIONS D13, D33 OR MX12 ARE NOT ORDERED.

D61 for Analog Signal Follower Drives Without Keypad or Comm Control Options

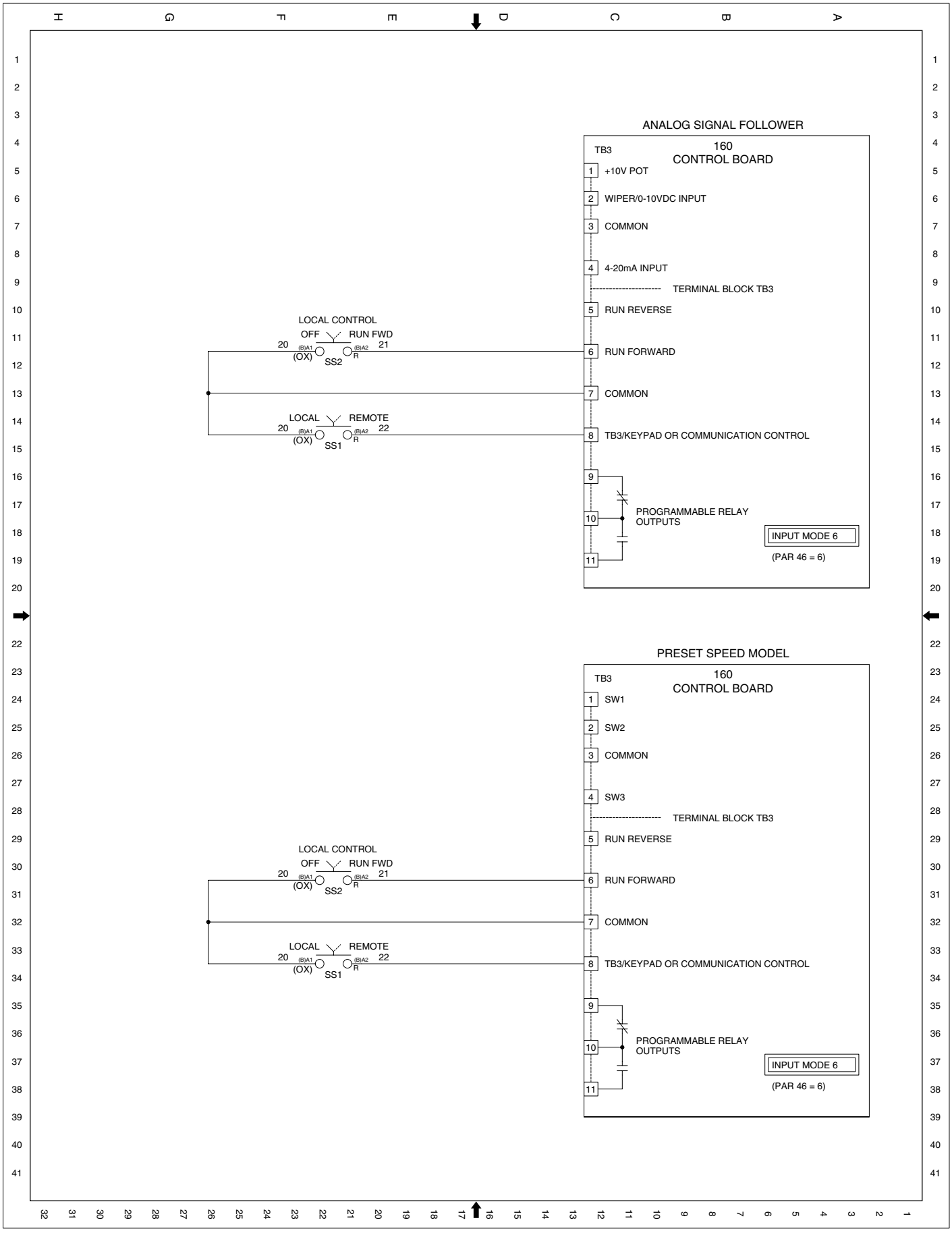


D61 for Analog Signal Follower Drives With Keypad or Comm Control Options

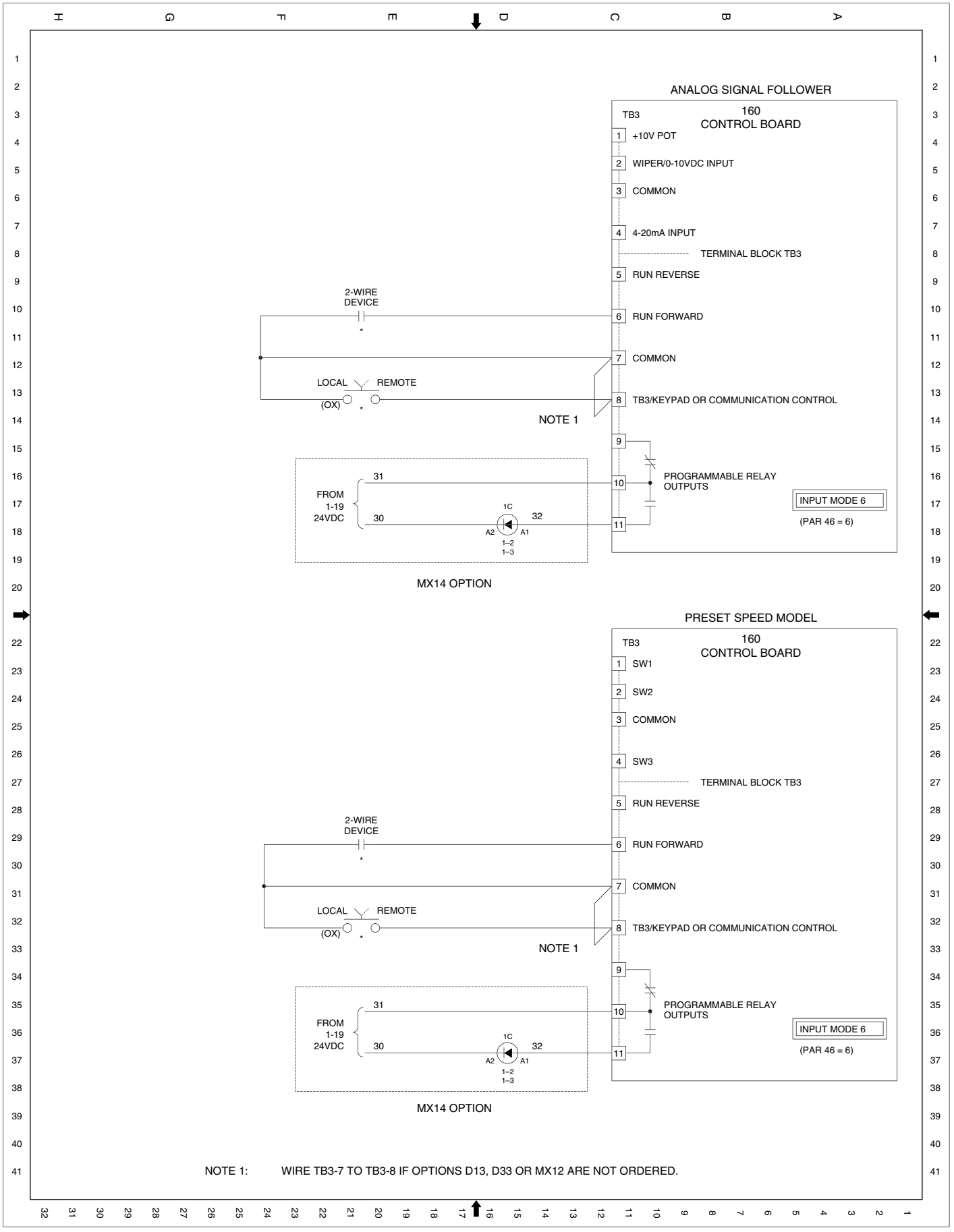


NOTE 1:

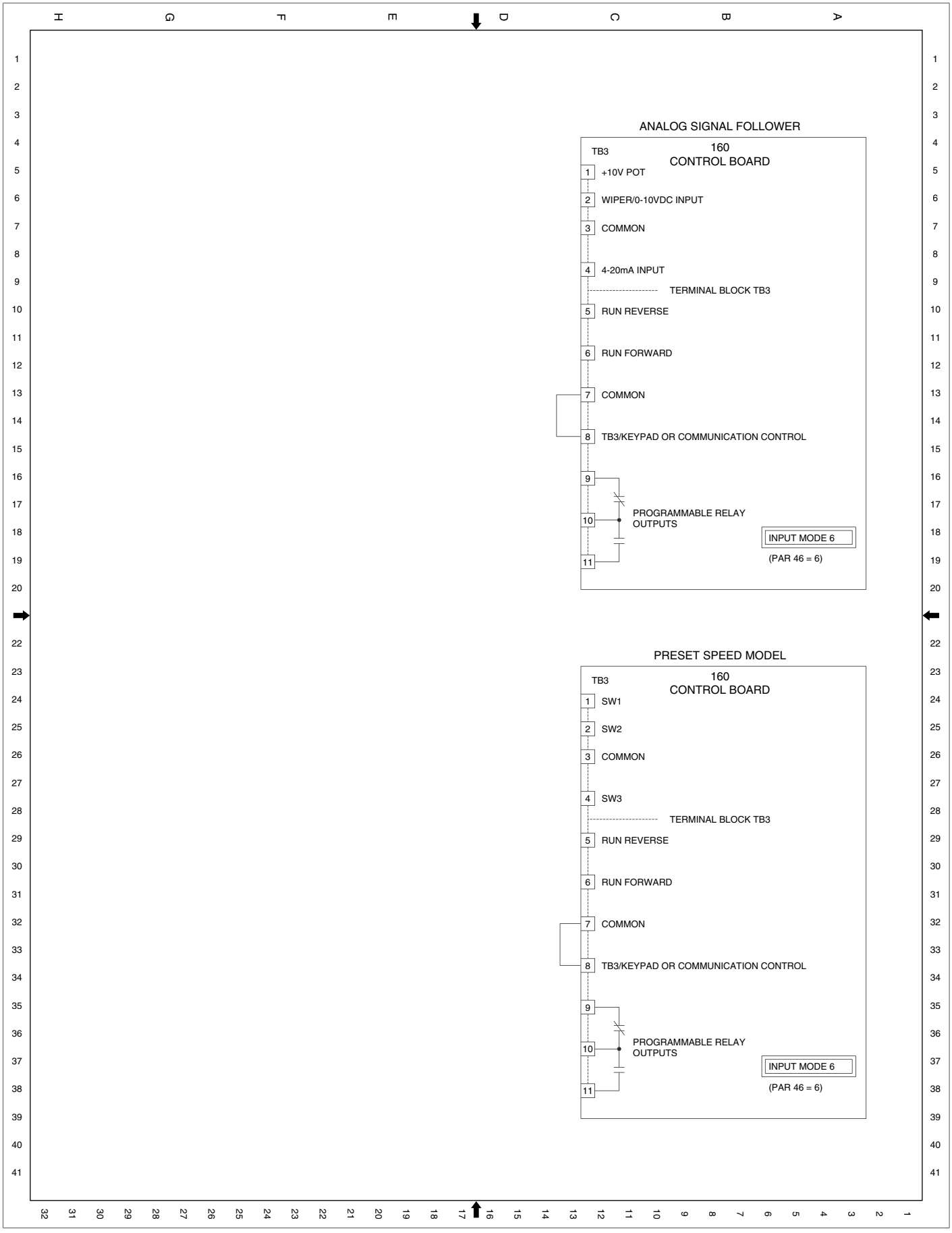
WIRE TB3-7 TO TB3-8 IF OPTIONS D13, D33 OR MX12 ARE NOT ORDERED.


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20 (B)A1 (OX)
21 (B)A2 R
SS2
LOCAL
REMOTE
20 (B)A1 (OX)
22 (B)A2 R
SS1
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20 (B)A1 (OX)
21 (B)A2 R
SS2
LOCAL
REMOTE
20 (B)A1 (OX)
22 (B)A2 R
SS1

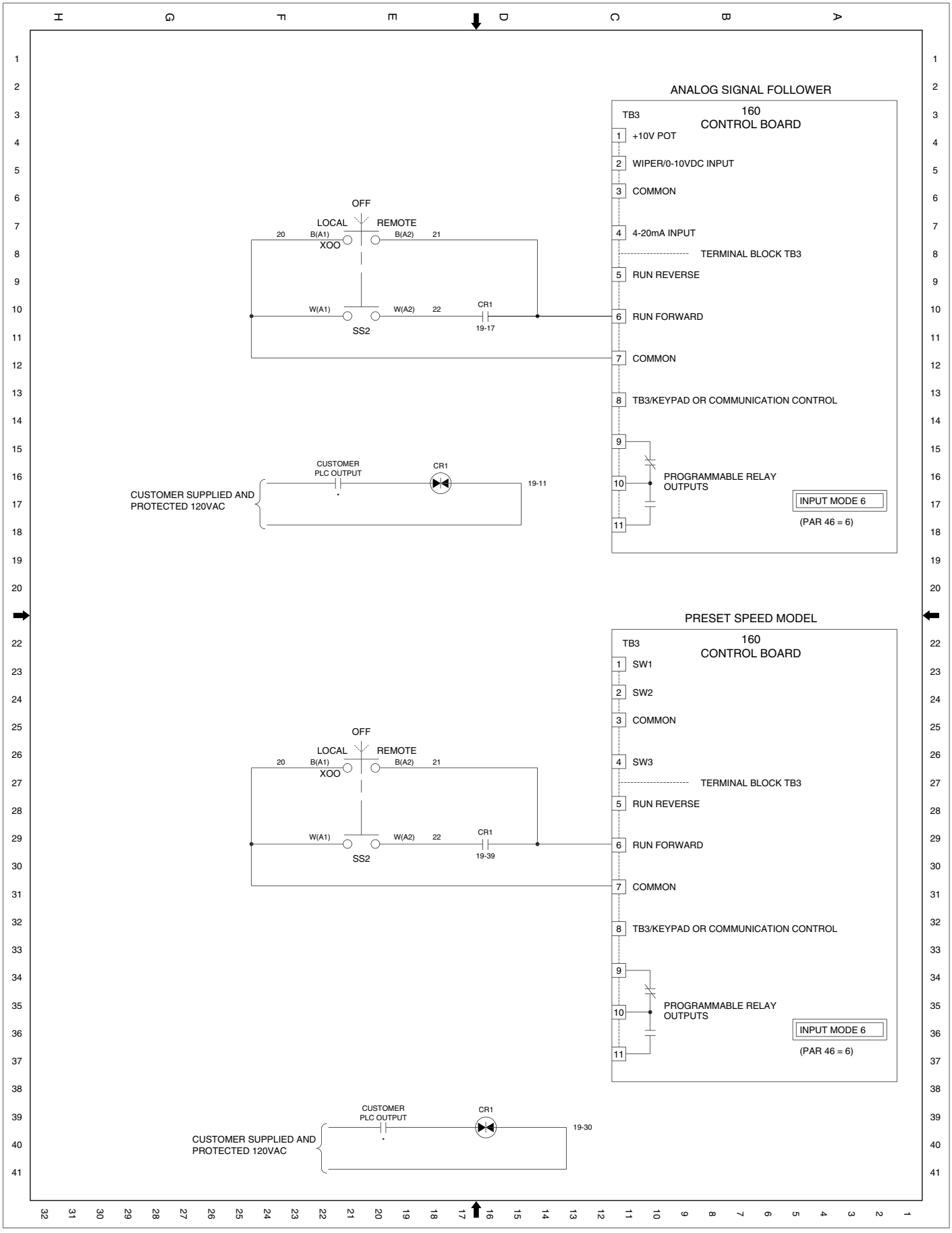
MX14


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
2-WIRE
DEVICE
6 RUN FORWARD
7 COMMON
LOCAL
REMOTE
(OX)
8 TB3/KEYPAD OR COMMUNICATION CONTROL
NOTE 1
9
31
10
PROGRAMMABLE RELAY
OUTPUTS
FROM
1-19
24VDC
30
1C
32
A2
A1
1–2
1–3
11
INPUT MODE 6
(PAR 46 = 6)
MX14 OPTION
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
2-WIRE
DEVICE
6 RUN FORWARD
7 COMMON
LOCAL
REMOTE
(OX)
8 TB3/KEYPAD OR COMMUNICATION CONTROL
NOTE 1
9
31
10
PROGRAMMABLE RELAY
OUTPUTS
FROM
1-19
24VDC
30
1C
32
A2
A1
1–2
1–3
11
INPUT MODE 6
(PAR 46 = 6)
MX14 OPTION
NOTE 1: WIRE TB3-7 TO TB3-8 IF OPTIONS D13, D33 OR MX12 ARE NOT ORDERED.

P2C


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)

MX19


ANALOG SIGNAL FOLLOWER
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
OFF
LOCAL
REMOTE
20
B(A1)
B(A2)
21
XOO
W(A1)
W(A2)
22
SS2
CR1
19-17
CUSTOMER PLC OUTPUT
CUSTOMER SUPPLIED AND PROTECTED 120VAC
19-11
PRESET SPEED MODEL
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
OFF
LOCAL
REMOTE
20
B(A1)
B(A2)
21
XOO
W(A1)
W(A2)
22
SS2
CR1
19-39
CUSTOMER PLC OUTPUT
CUSTOMER SUPPLIED AND PROTECTED 120VAC
19-30

Notes

Twenty-Four Volt DC (24VDC) Control Interface for Analog and Preset Drives

Power Distribution and DS Option 28

Operator Interface Options DN2C, RS1C, P1C, RPAC, P2C, and Ready/Fault Panel 28

Enclosure Mounted DeviceNet Connector Options: DNSC1, DNSC2, DNBC1, DNBC2 28

Drive Ratings and DS Option Ratings 29

Product Control Logic Options

D13 Without P2C 30

D13 With P2C 31

D17 32

D32 33

D33 34

D13 and D32 Without P2C 35

D13 and D32 With P2C 36

D17 and D32 37

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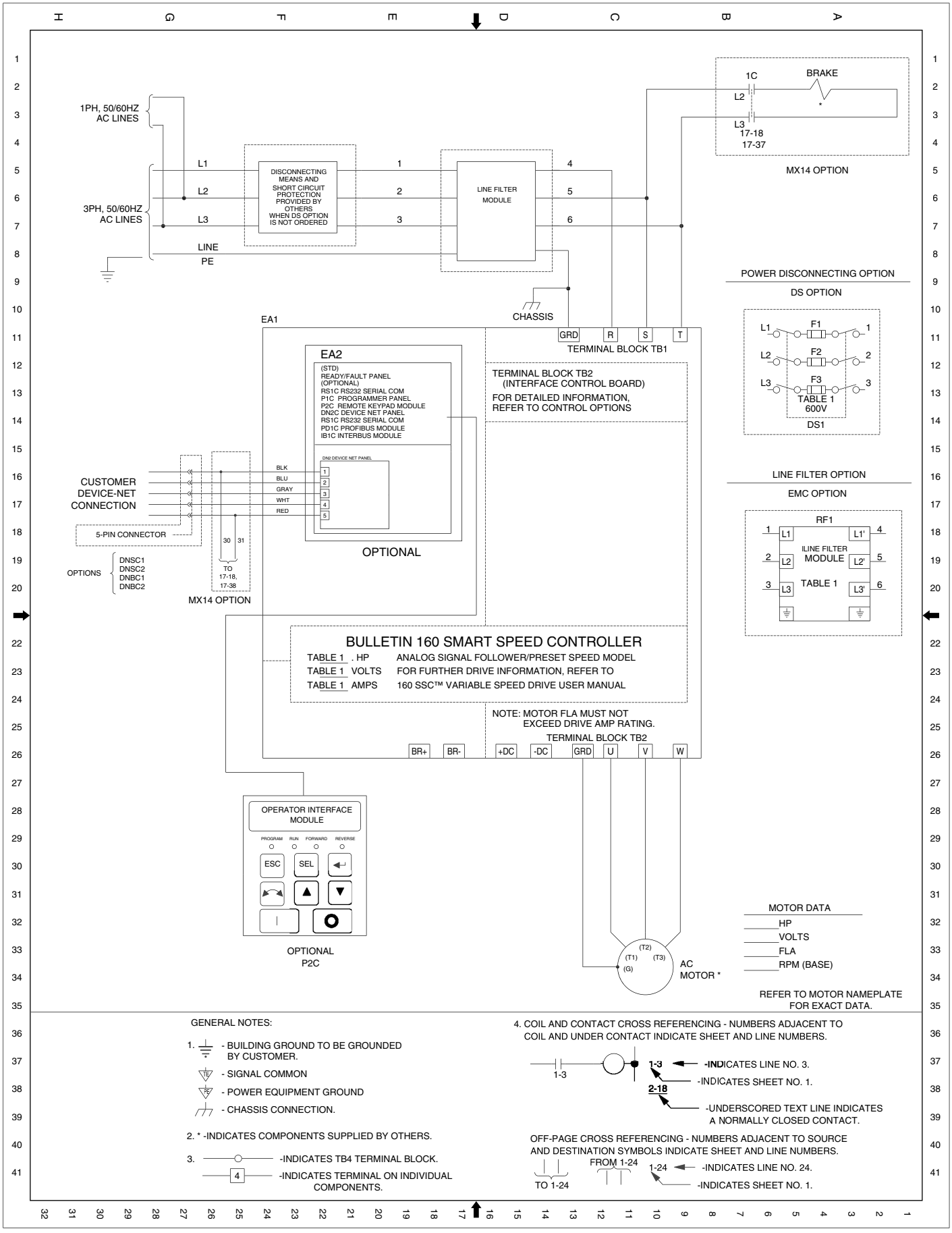
Power Distribution and DS Option



Drive Ratings and DS Option Ratings

TABLE 1

SINGLE PHASE

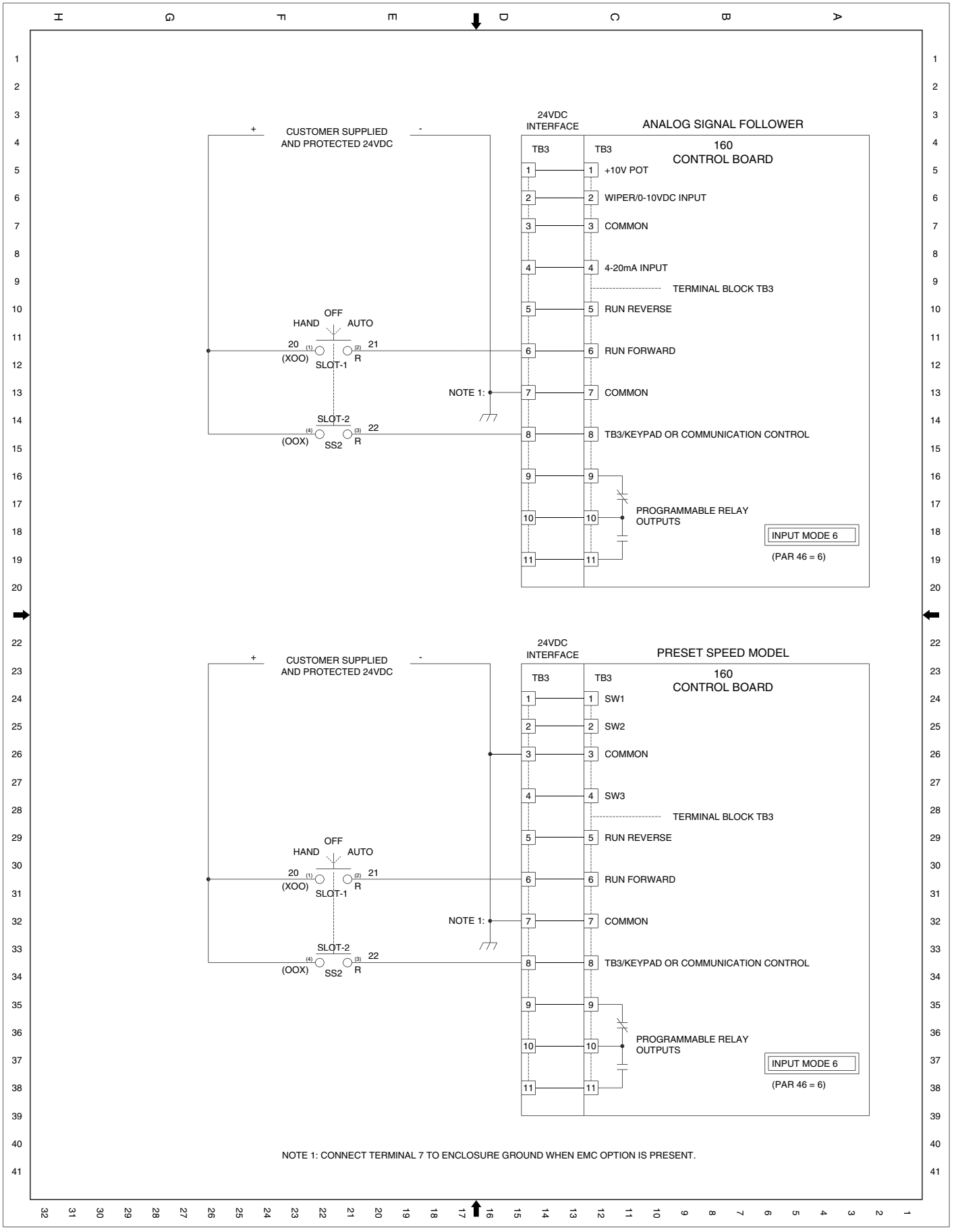
DRIVE RATINGS CATALOG NO. (HP)	VOLTAGE	FLA	FUSE RATINGS (DS OPTION) TYPE	AMP	VOLT	LINE FILTER MODULE CATALOG NUMBER
160S-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V	160S-RFA-9-A
160S-AA03* (.75)	200-240V	3.0A	LPJ	10A	600V	160S-RFA-9-A
160S-AA04* (1)	200-240V	4.5A	LPJ	15A	600V	160S-RFA-9-A
160S-AA08* (2)	200-240V	8.0A	LPJ	30A	600V	160S-RFA-16-B

THREE PHASE

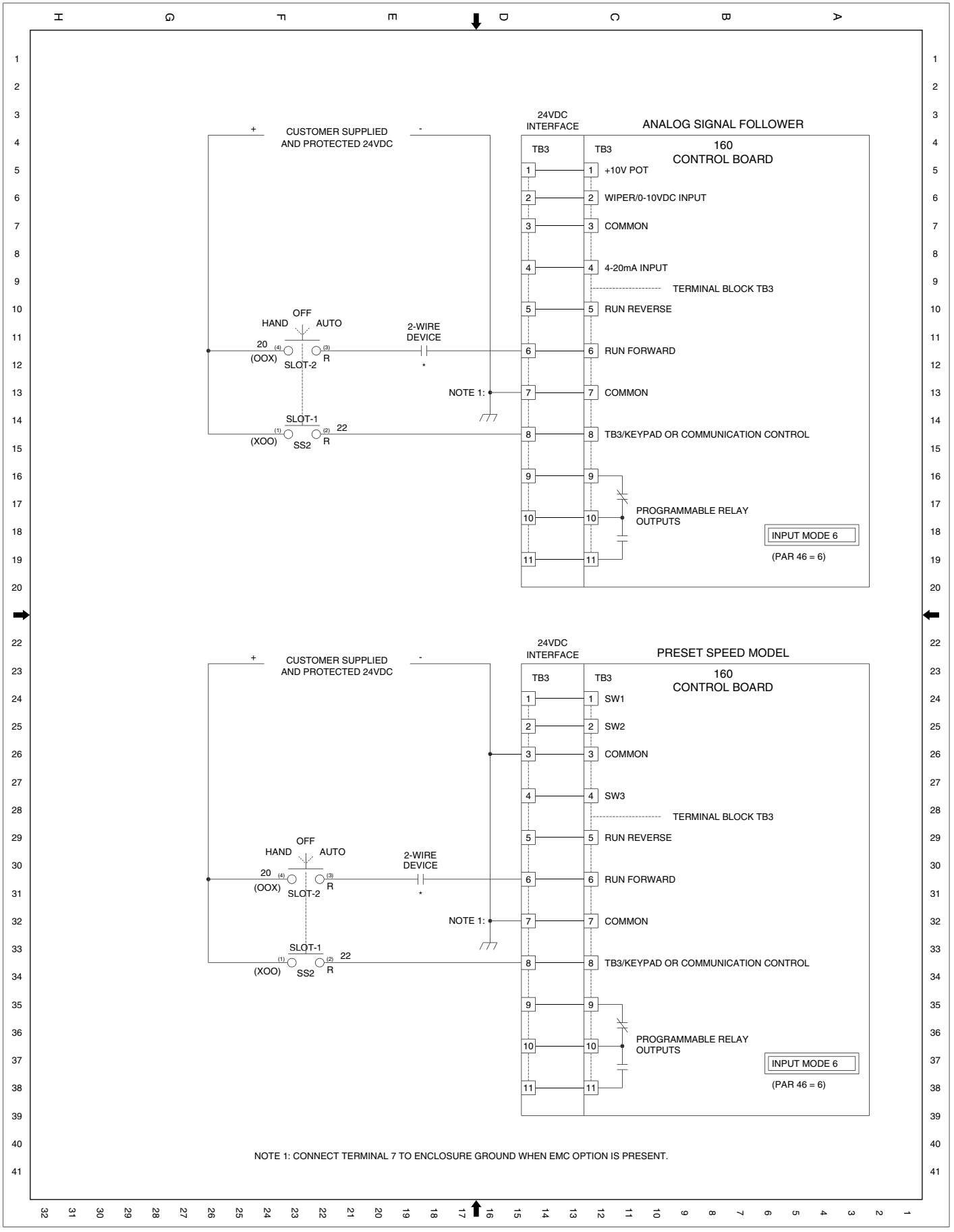
DRIVE RATINGS CATALOG NO. (HP)	VOLTAGE	FLA	FUSE RATINGS (DS OPTION) TYPE	AMP	VOLT	LINE FILTER MODULE CATALOG NUMBER
160-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V	160-RFB-5-A
160-AA03* (.75)	200-240V	3.0A	LPJ	6A	600V	160-RFB-5-A
160-AA04* (1)	200-240V	4.5A	LPJ	10A	600V	160-RFB-5-A
160-AA08* (2)	200-240V	8.0A	LPJ	15A	600V	160-RFB-14-A
160-AA12* (3)	200-240V	12.0A	LPJ	20A	600V	160-RFB-14-A
160-AA18* (5)	200-240V	18.0A	LPJ	30A	600V	160-RFB-22-B
160-BA01* (.5)	380-460V	1.2A	LPJ	4A	600V	160-RFB-5-A
160-BA02* (.75)	380-460V	1.7A	LPJ	4A	600V	160-RFB-5-A
160-BA03* (1)	380-460V	2.3A	LPJ	5A	600V	160-RFB-5-A
160-BA04* (2)	380-460V	4.0A	LPJ	8A	600V	160-RFB-5-A
160-BA06* (3)	380-460V	6.0A	LPJ	15A	600V	160-RFB-14-A
160-BA10* (5)	380-460V	10.5A	LPJ	20A	600V	160-RFB-14-B

* - CATALOG NO. SUFFIX CAN CONTAIN "SF1" OR "PS1"

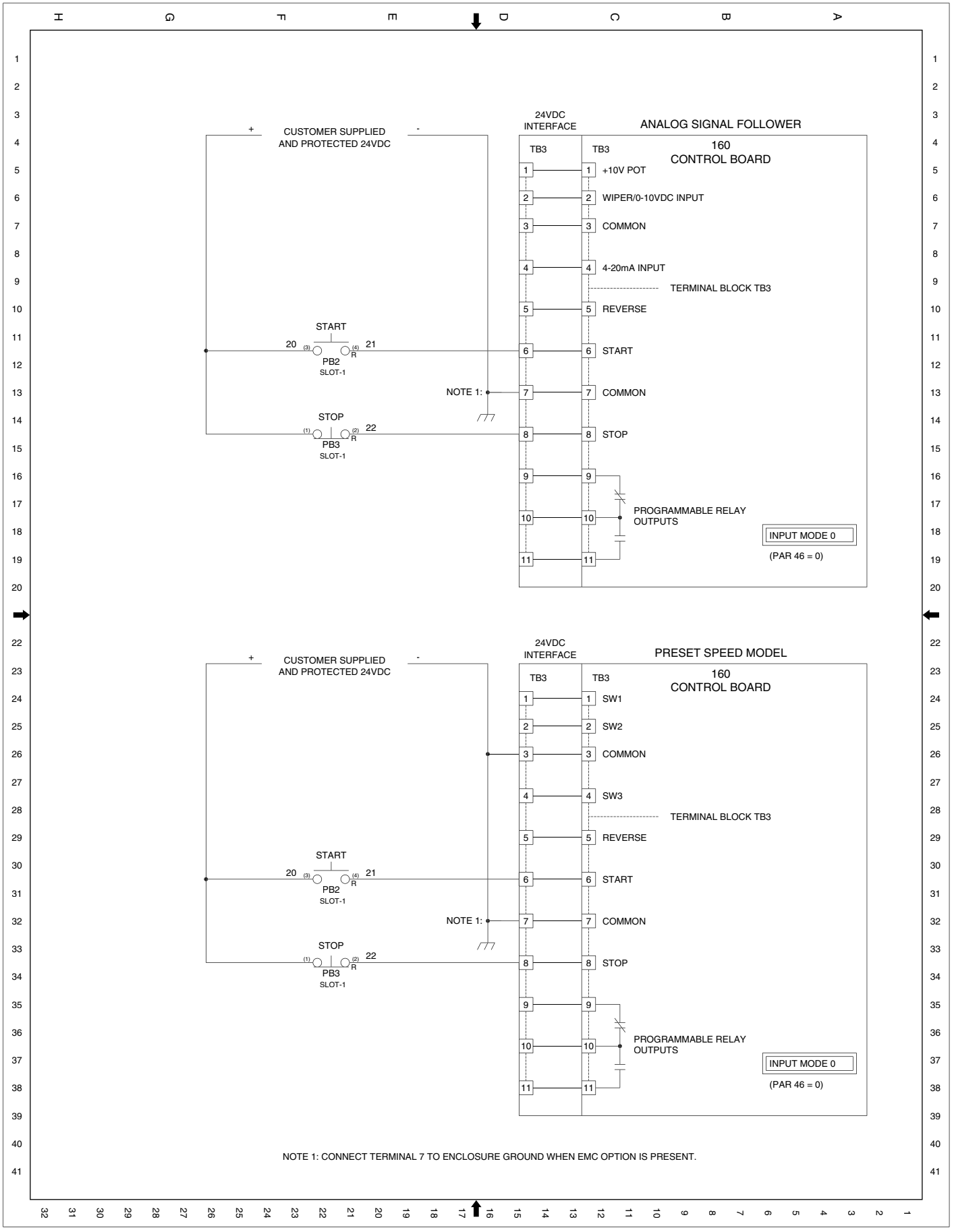
D13 Without P2C



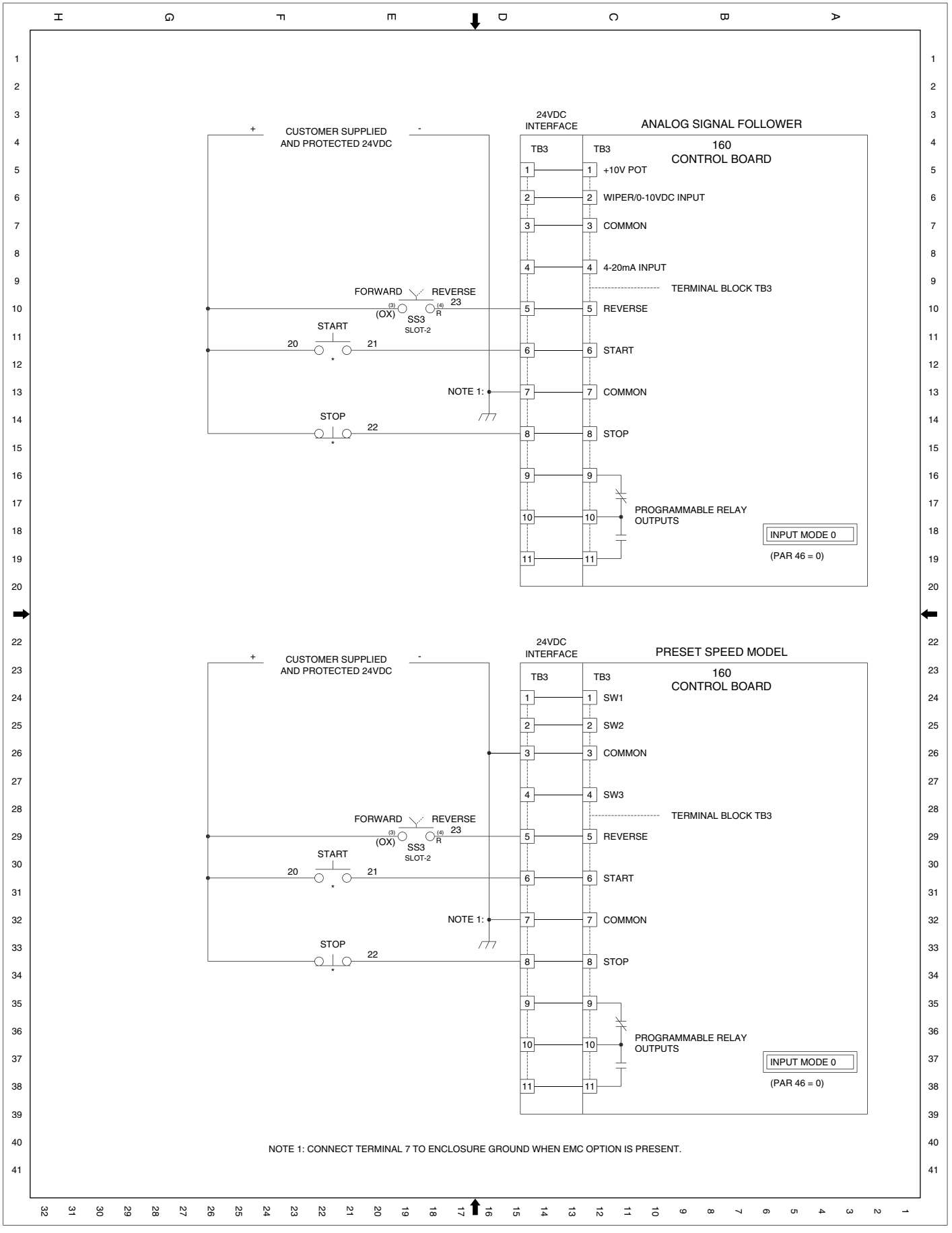
D13 With P2C


24VDC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 24VDC
+
-
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
OFF
HAND
AUTO
20 (OOX)
SLOT-2
R
2-WIRE DEVICE
NOTE 1:
SLOT-1
(XOO)
SS2
22
24VDC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 24VDC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

D17

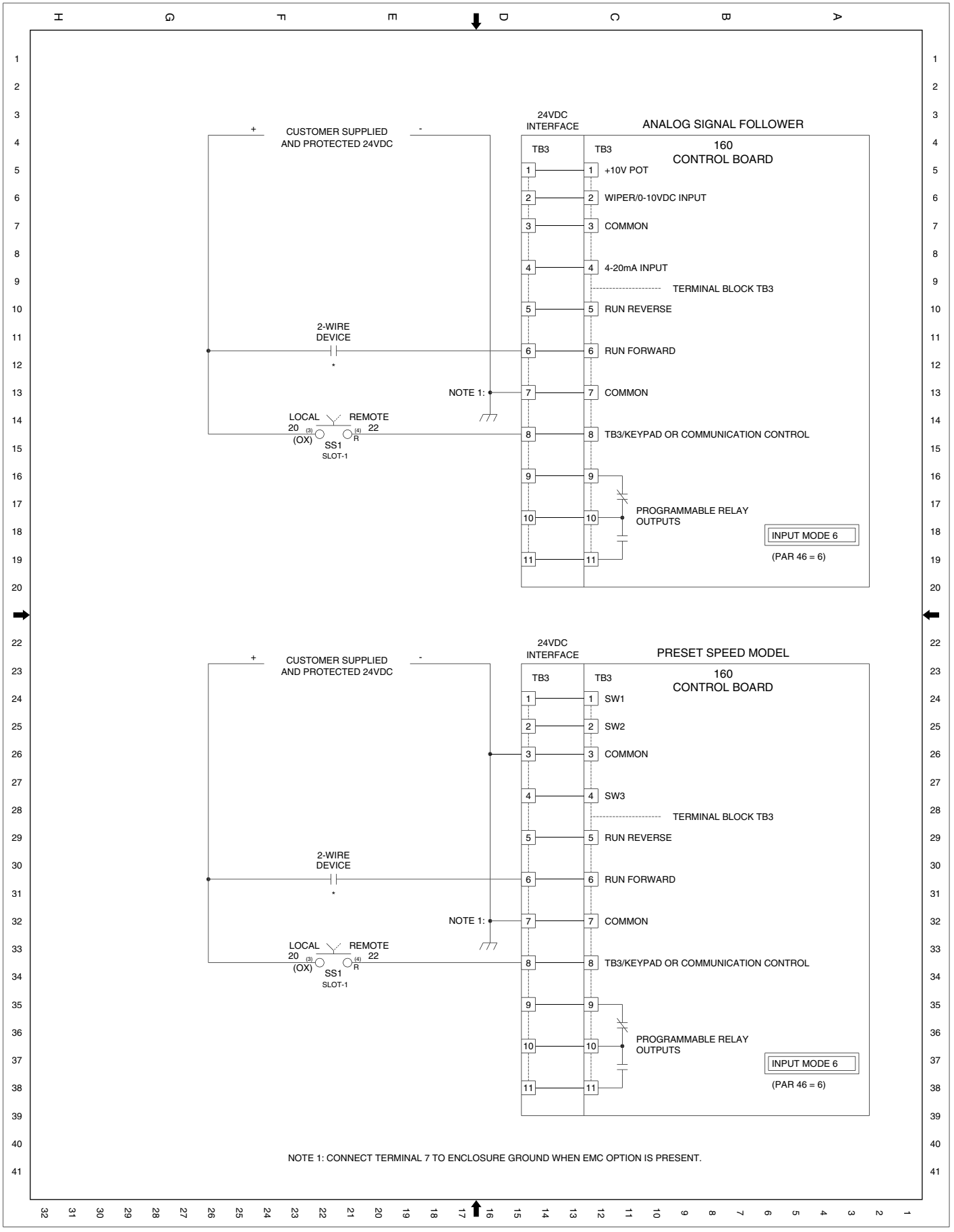

ANALOG SIGNAL FOLLOWER
24VDC INTERFACE
CUSTOMER SUPPLIED AND PROTECTED 24VDC
+
-
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
START
20
21
PB2
SLOT-1
STOP
22
PB3
SLOT-1
NOTE 1:
PRESET SPEED MODEL
SW1
SW2
SW3
NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

D32

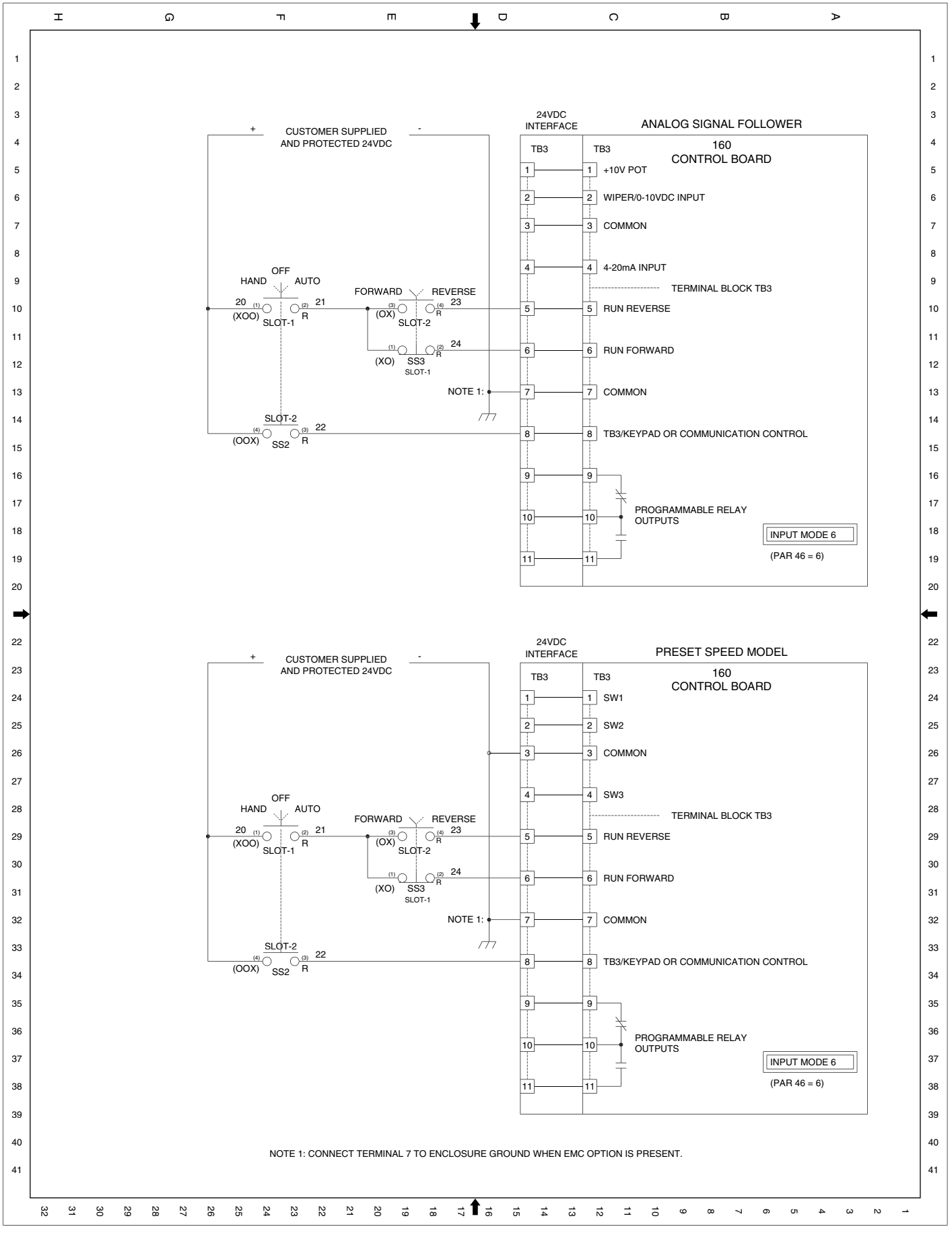


NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

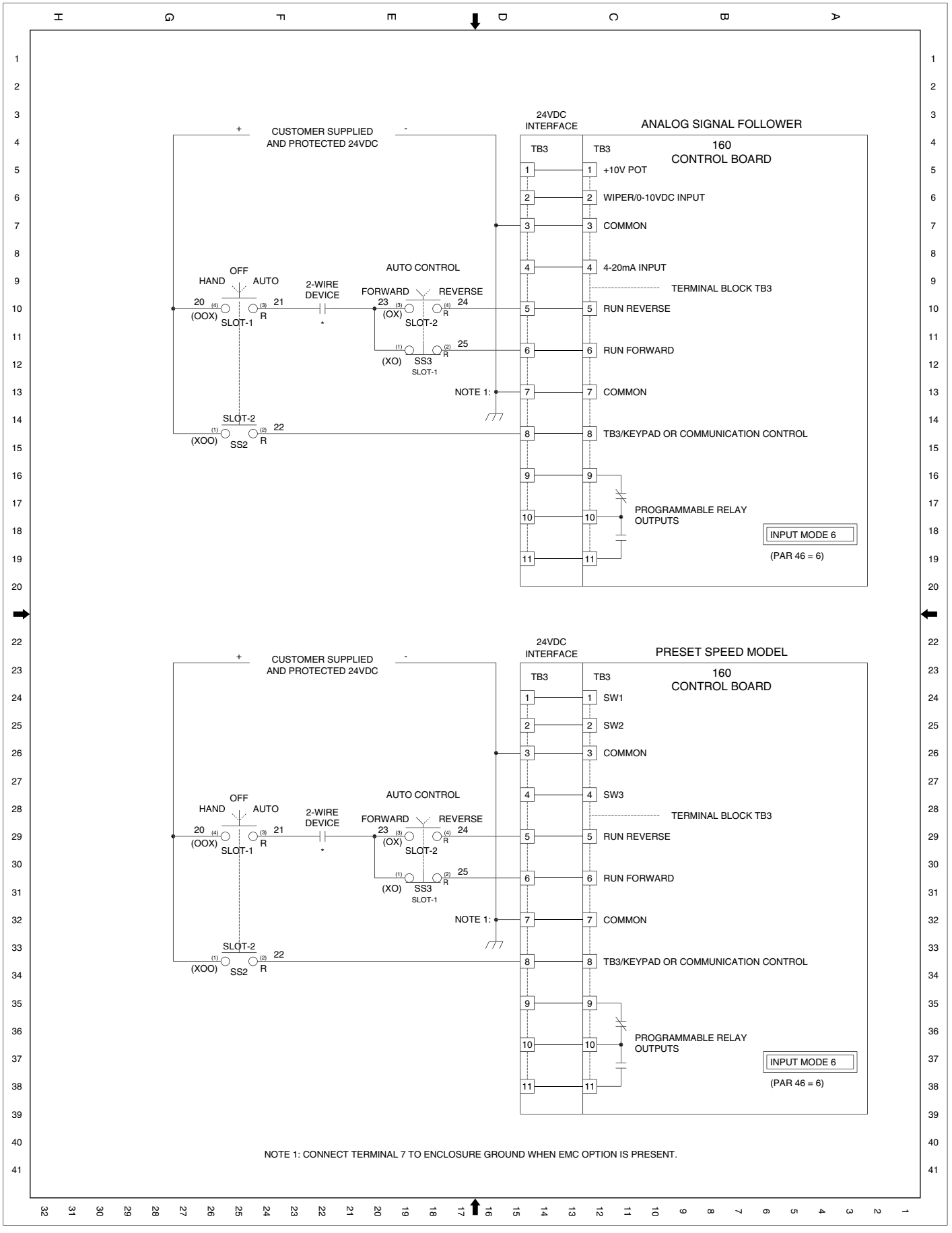
D33


24VDC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 24VDC
+
-
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
2-WIRE DEVICE
*
NOTE 1:
LOCAL
REMOTE
20 (3) (OX)
(4) R 22
SS1
SLOT-1
INPUT MODE 6
(PAR 46 = 6)
24VDC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 24VDC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
2-WIRE DEVICE
NOTE 1:
INPUT MODE 6
(PAR 46 = 6)
NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

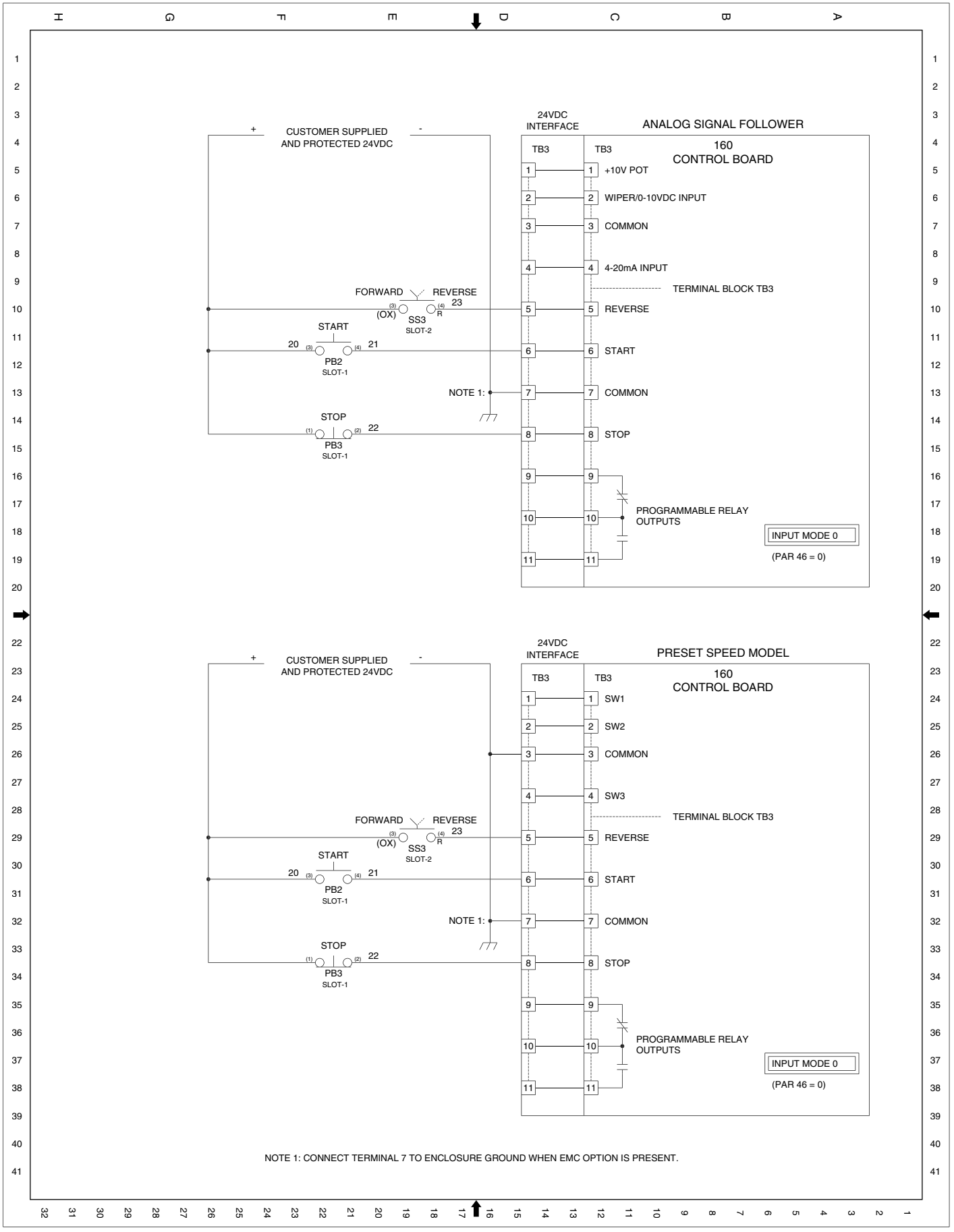
D13 and D32 Without P2C



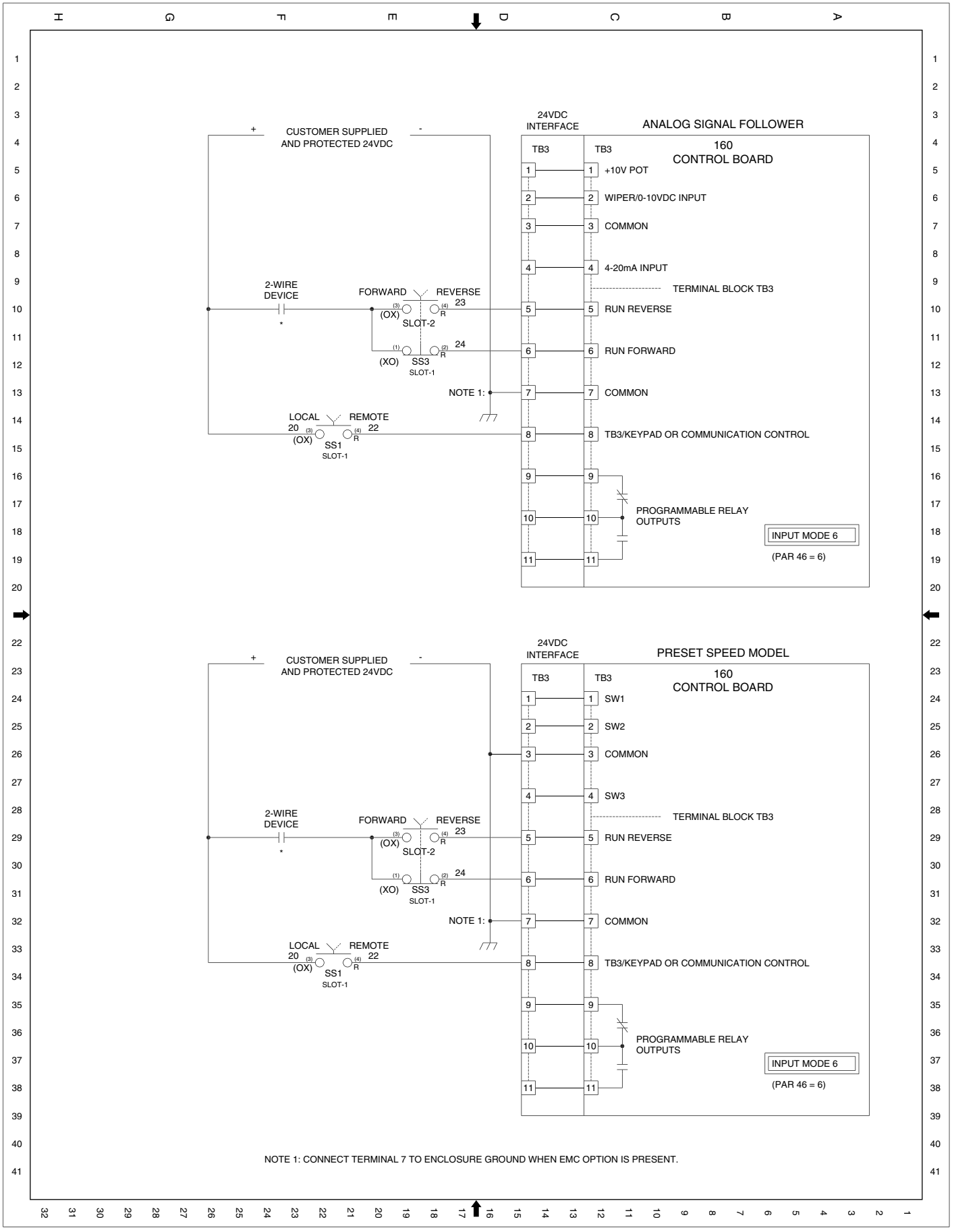
D13 and D32 With P2C



D17 and D32


24VDC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 24VDC
+
-
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10 PROGRAMMABLE RELAY OUTPUTS
11
FORWARD
REVERSE
23
(OX)
SS3
SLOT-2
START
20
21
PB2
SLOT-1
NOTE 1:
STOP
22
PB3
SLOT-1
INPUT MODE 0
(PAR 46 = 0)
24VDC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 24VDC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10 PROGRAMMABLE RELAY OUTPUTS
11
INPUT MODE 0
(PAR 46 = 0)
NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

D32 and D33

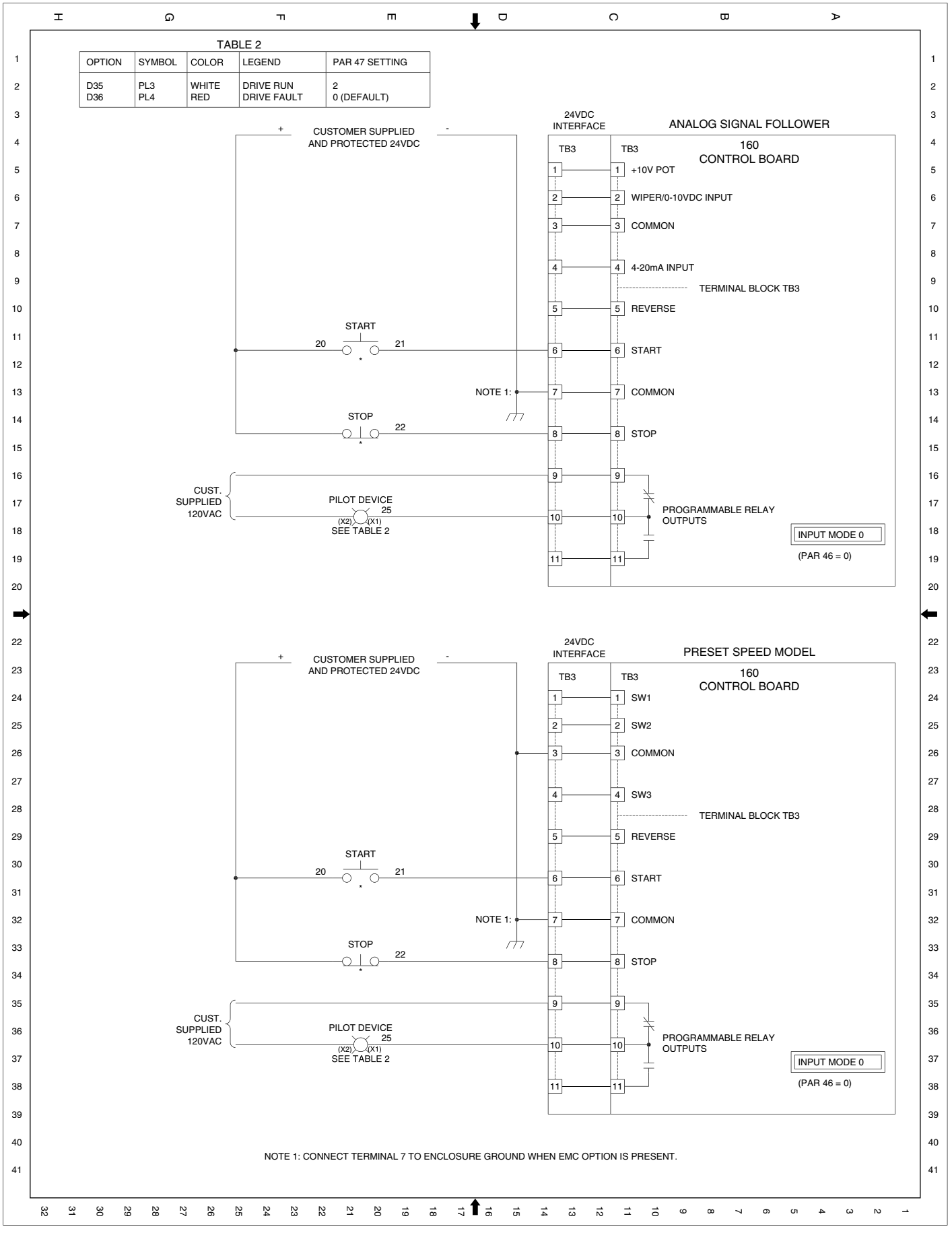


NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

D35 and D36 Without Keypad or Comm Control Options

TABLE 2

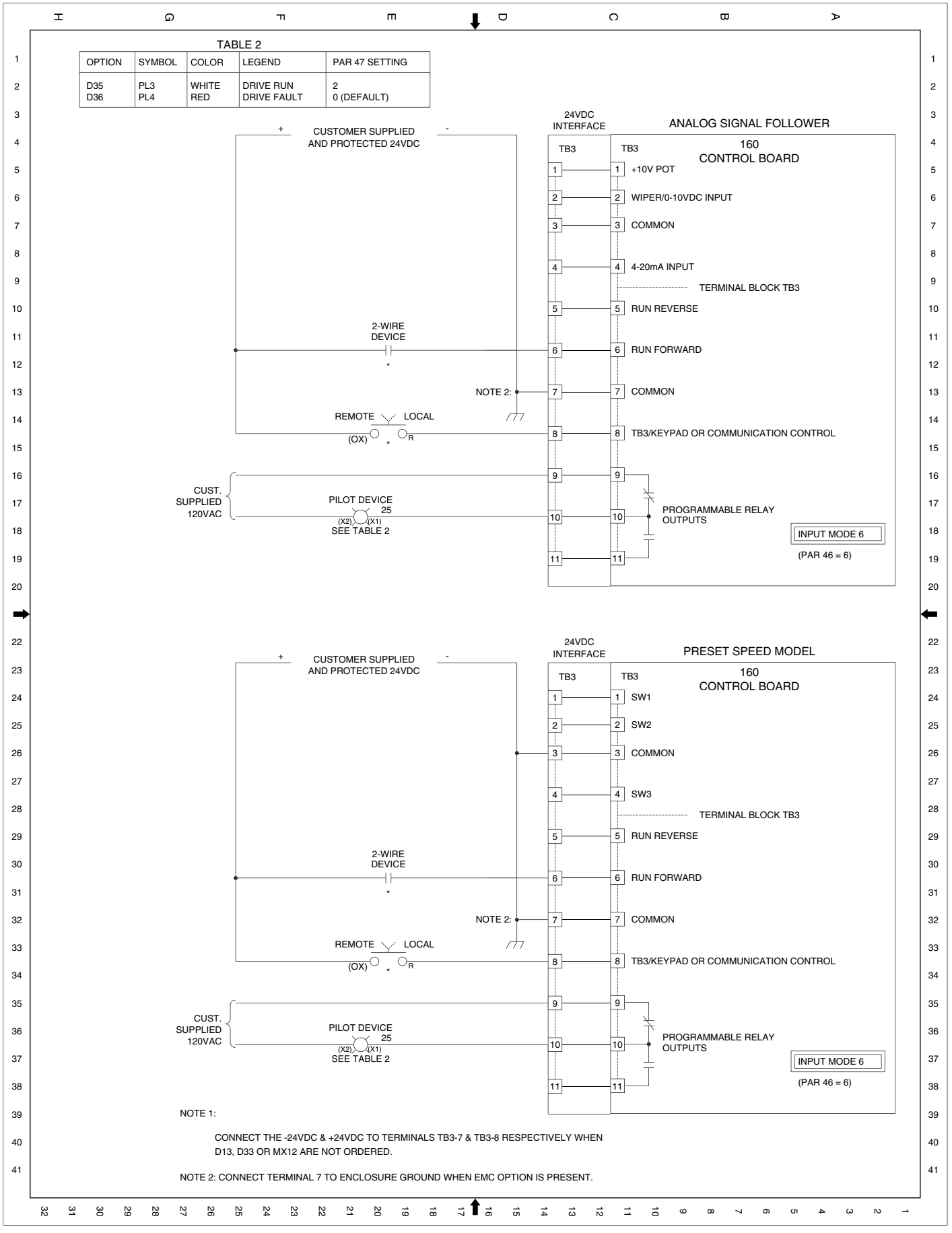
OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)



D35 and D36 With Keypad or Comm Control Options

TABLE 2

OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)

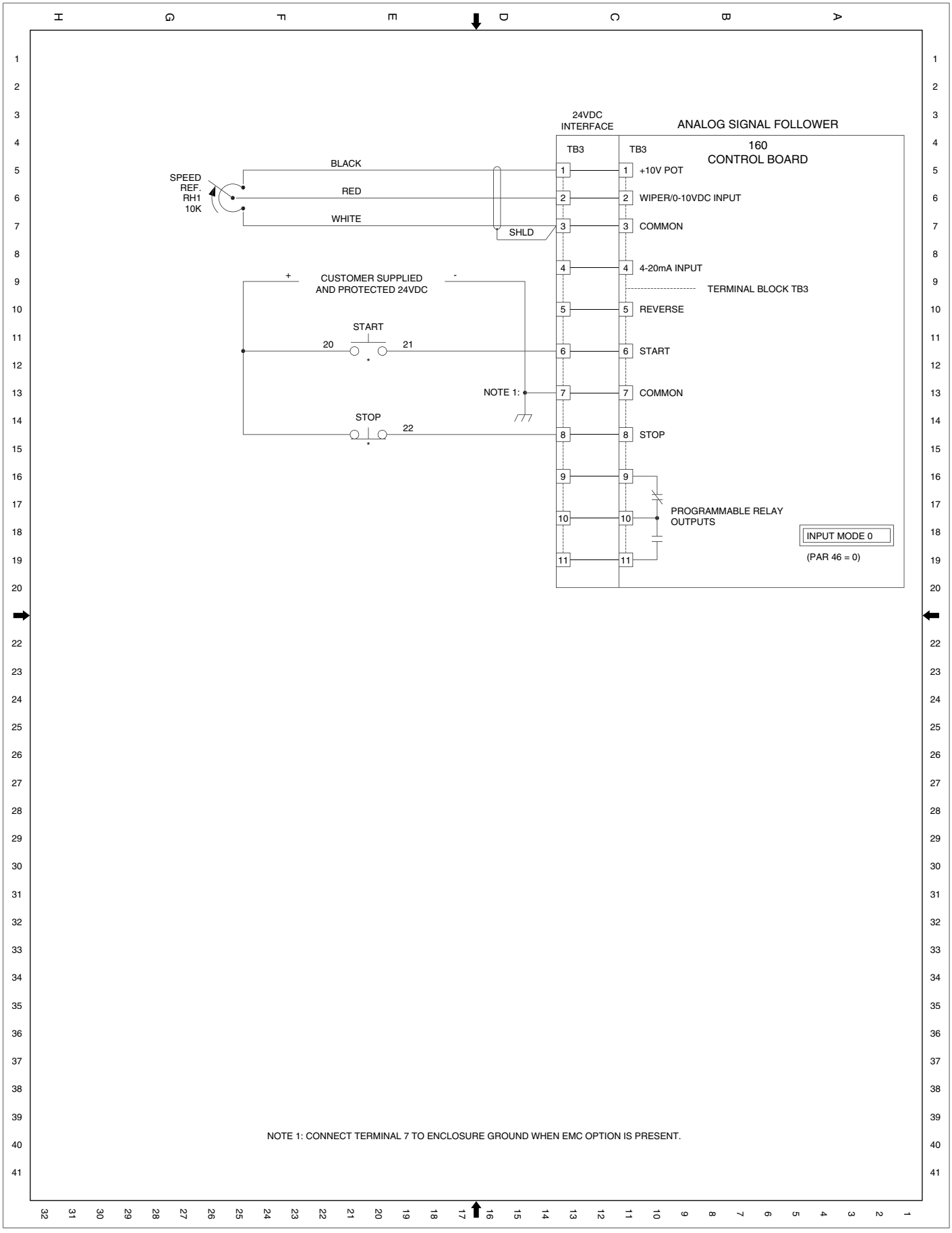


NOTE 1:

CONNECT THE -24VDC & +24VDC TO TERMINALS TB3-7 & TB3-8 RESPECTIVELY WHEN D13, D33 OR MX12 ARE NOT ORDERED.

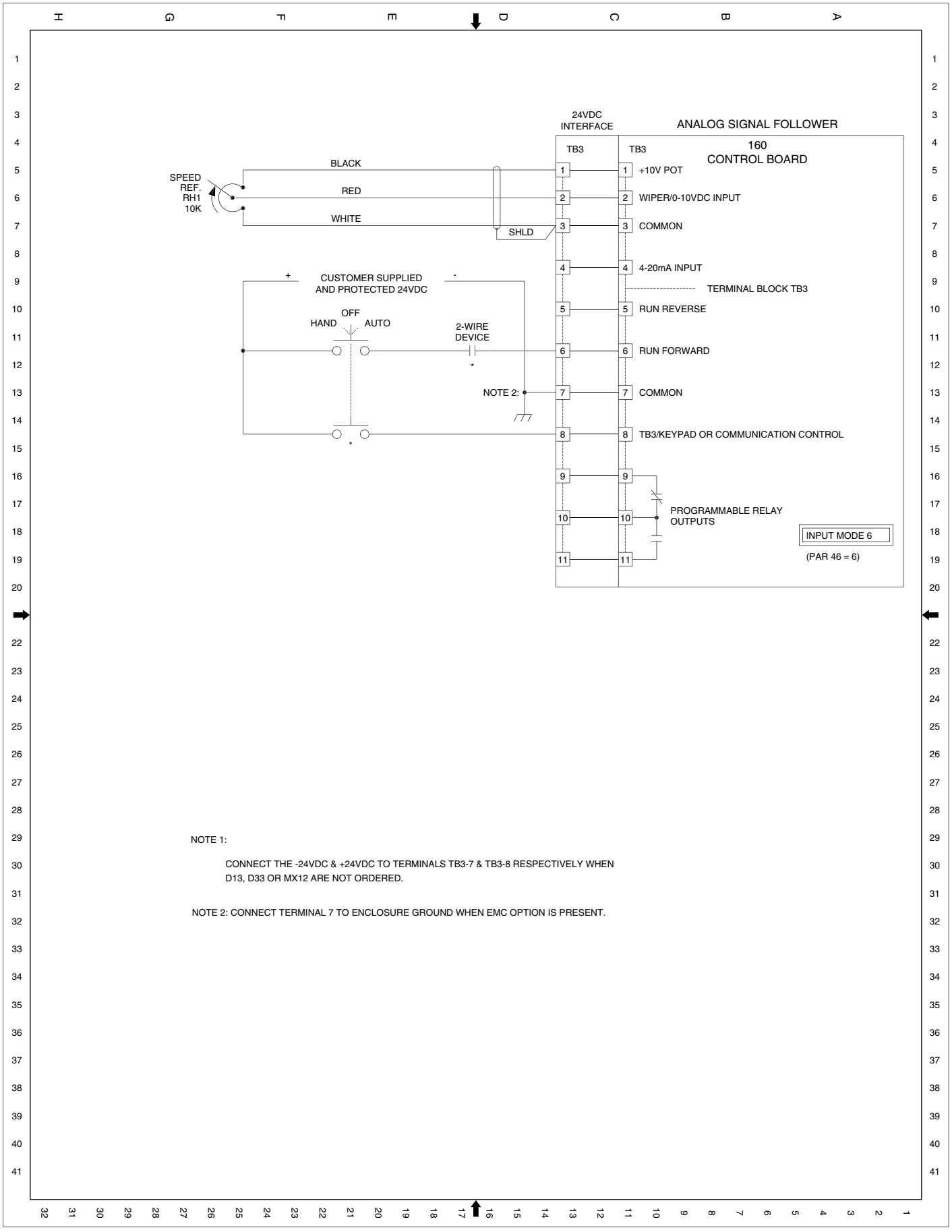
NOTE 2: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

D61 for Analog Signal Follower Drives Without Keypad or Comm Control Options



NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

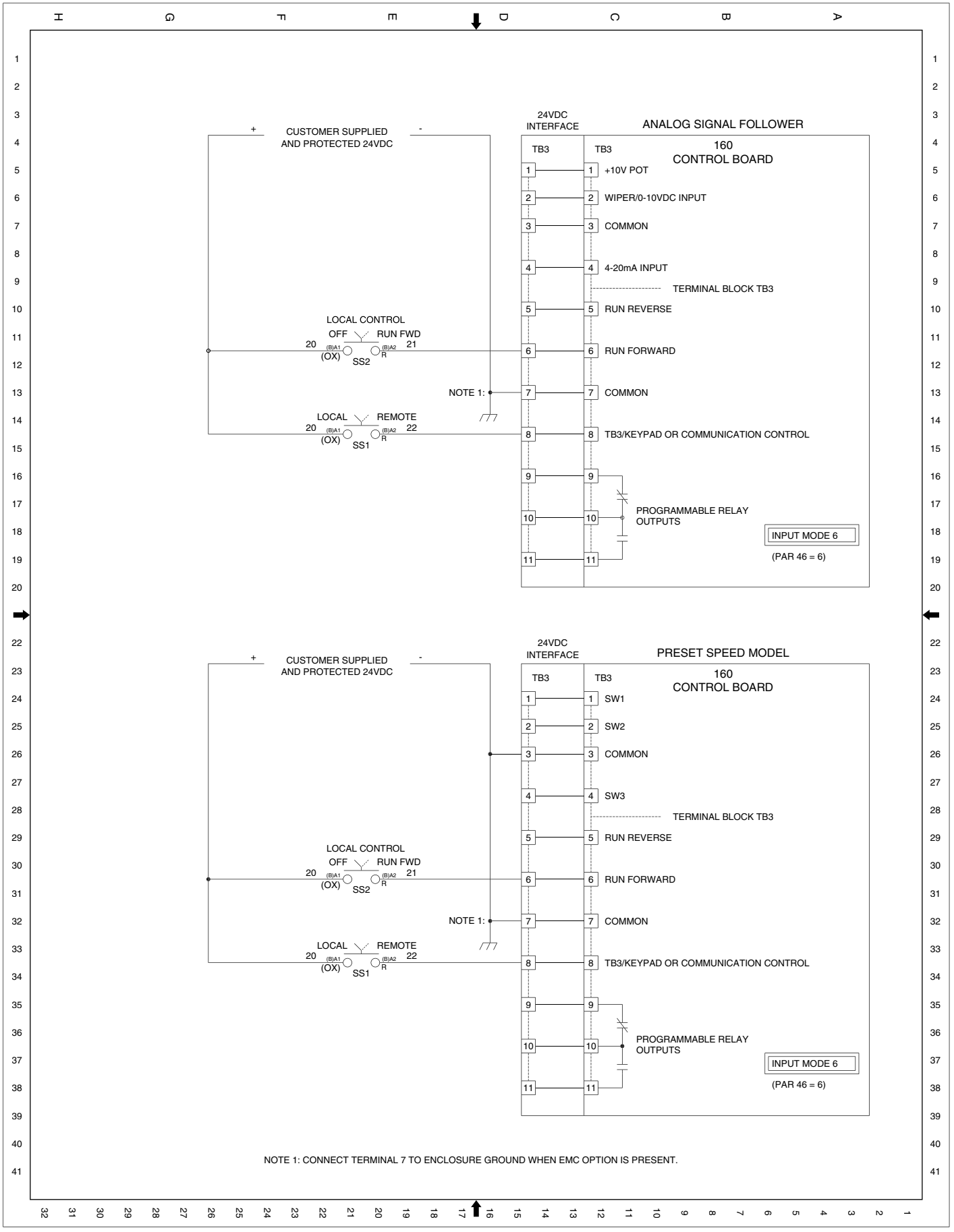
D61 for Analog Signal Follower Drives With Keypads or Comm Control Options



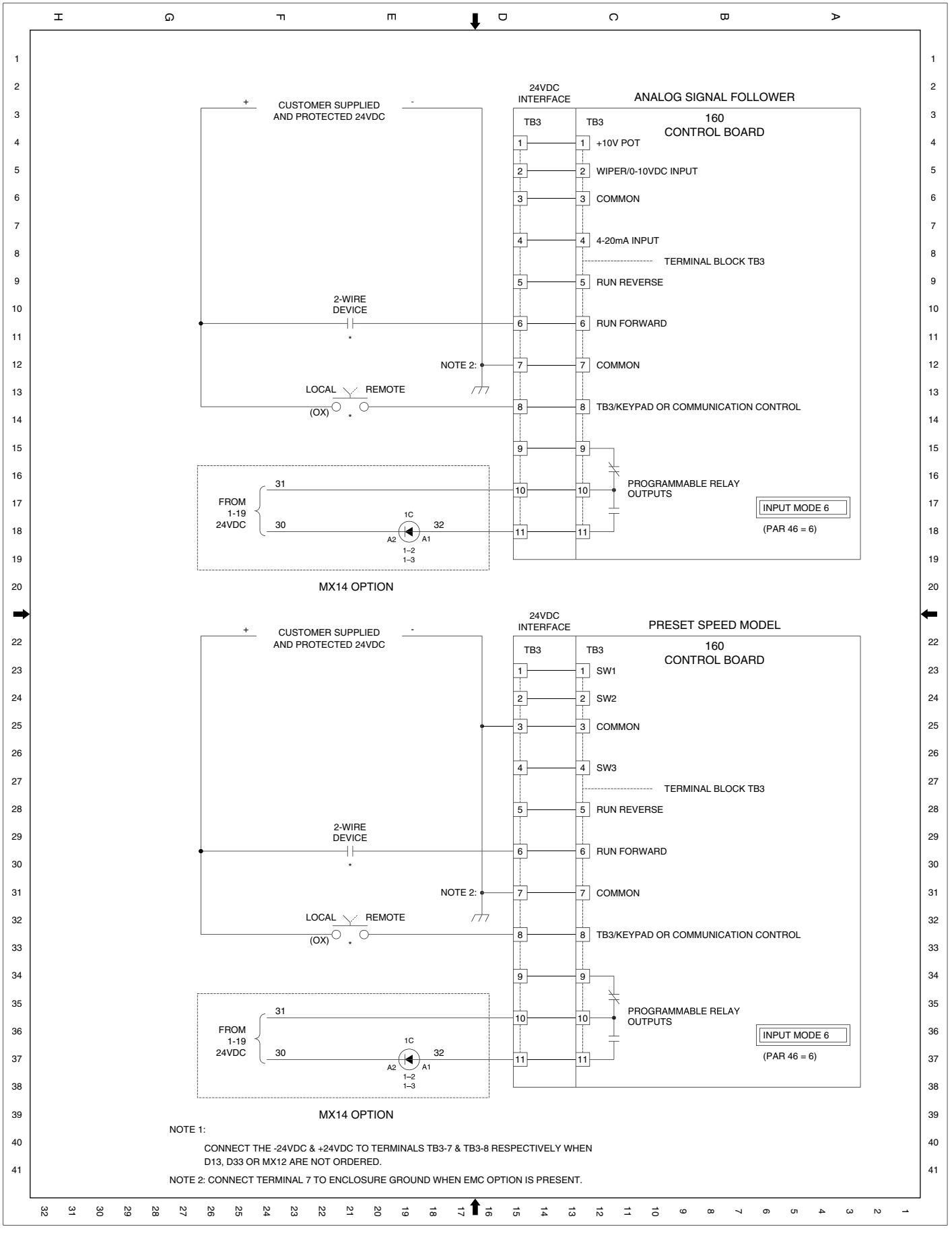
NOTE 1:

CONNECT THE -24VDC & +24VDC TO TERMINALS TB3-7 & TB3-8 RESPECTIVELY WHEN D13, D33 OR MX12 ARE NOT ORDERED.

NOTE 2: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.


24VDC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 24VDC
+
-
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20
21
(B)A1
(B)A2
(OX)
R
SS2
NOTE 1:
LOCAL
REMOTE
22
SS1
24VDC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 24VDC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20
21
(B)A1
(B)A2
(OX)
R
SS2
NOTE 1:
LOCAL
REMOTE
22
SS1
NOTE 1: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

MX14

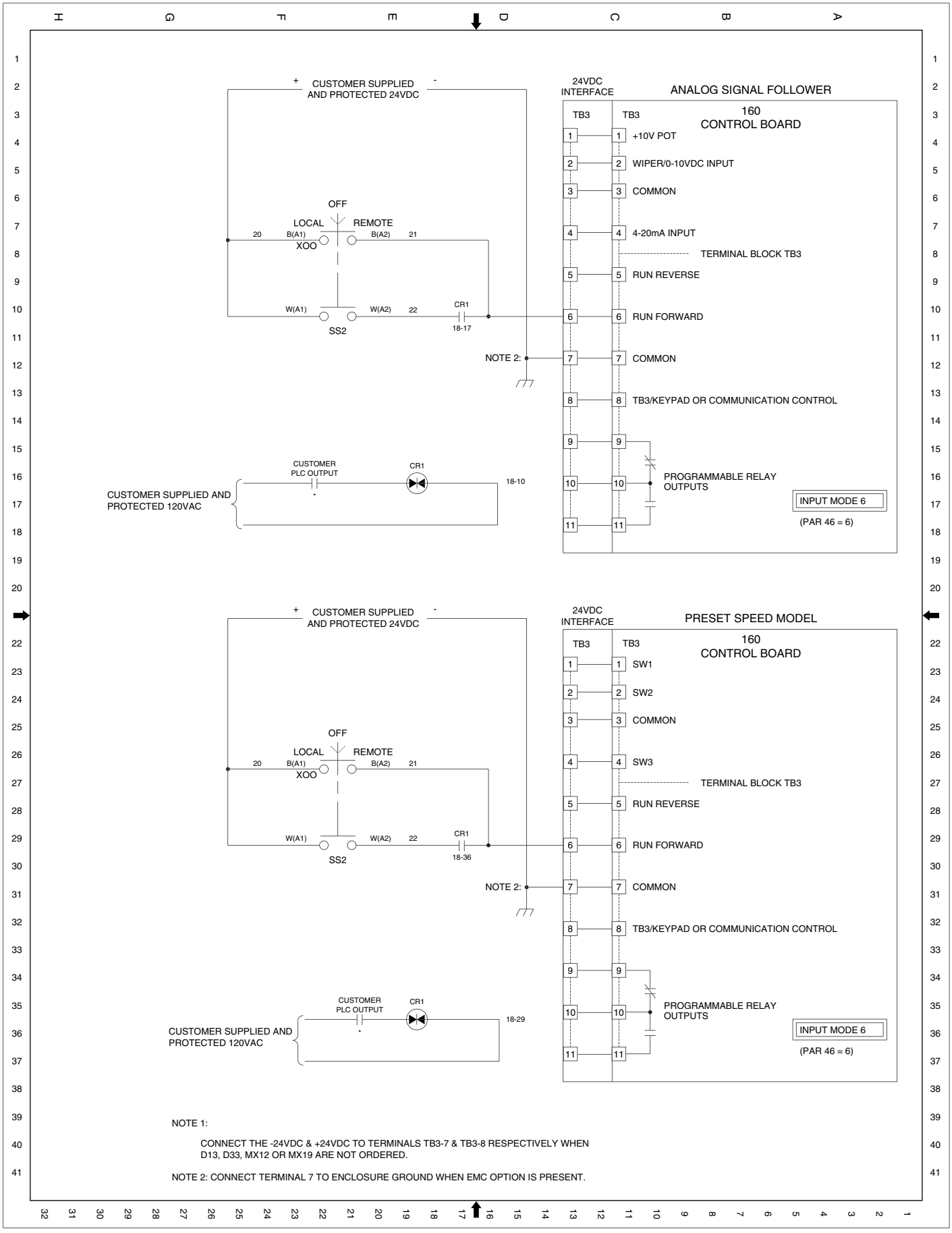


NOTE 1:

CONNECT THE -24VDC & +24VDC TO TERMINALS TB3-7 & TB3-8 RESPECTIVELY WHEN D13, D33 OR MX12 ARE NOT ORDERED.

NOTE 2: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

MX19



NOTE 1:

CONNECT THE -24VDC & +24VDC TO TERMINALS TB3-7 & TB3-8 RESPECTIVELY WHEN D13, D33, MX12 OR MX19 ARE NOT ORDERED.

NOTE 2: CONNECT TERMINAL 7 TO ENCLOSURE GROUND WHEN EMC OPTION IS PRESENT.

Notes

One Hundred Twenty Volt AC (120VAC) Control Interface for Analog and Preset Drives

Power Distribution and DS Option 48

Operator Interface Options DN2C, RS1C, P1C, RPAC, P2C, and Ready/Fault Panel 48

Enclosure Mounted DeviceNet Connector Options: DNSC1, DNSC2, DNBC1, DNBC2 48

Drive Ratings and DS Option Ratings 49

Product Control Logic Options

D13 Without P2C 50

D13 With P2C 51

D17 52

D32 53

D33 54

D13 and D32 Without P2C 55

D13 and D32 With P2C 56

D17 and D32 57

D32 and D33 58

D35 and D36 Without Keypad or Comm Control Options 59

D35 and D36 With Keypad or Comm Control Options 60

D61 for Analog Signal Follower Drives Without Keypad or Comm Control Options 61

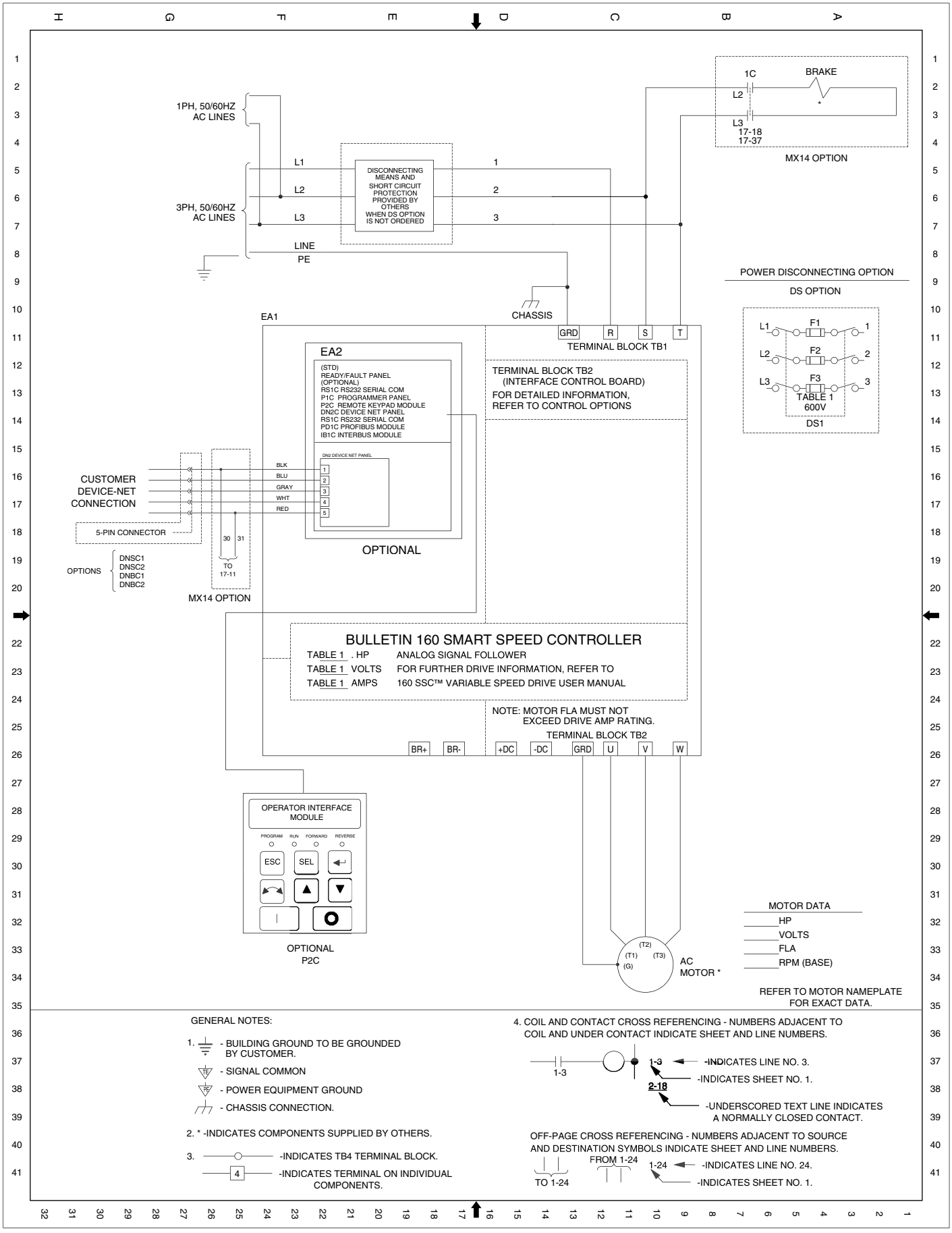
D61 for Analog Signal Follower Drives With Keypad or Comm Control Options 62

MX12 63

MX14 . . . . . 48 and 64

MX19 65

Power Distribution and DS Option



Drive Ratings and DS Option Ratings

TABLE 1

SINGLE PHASE

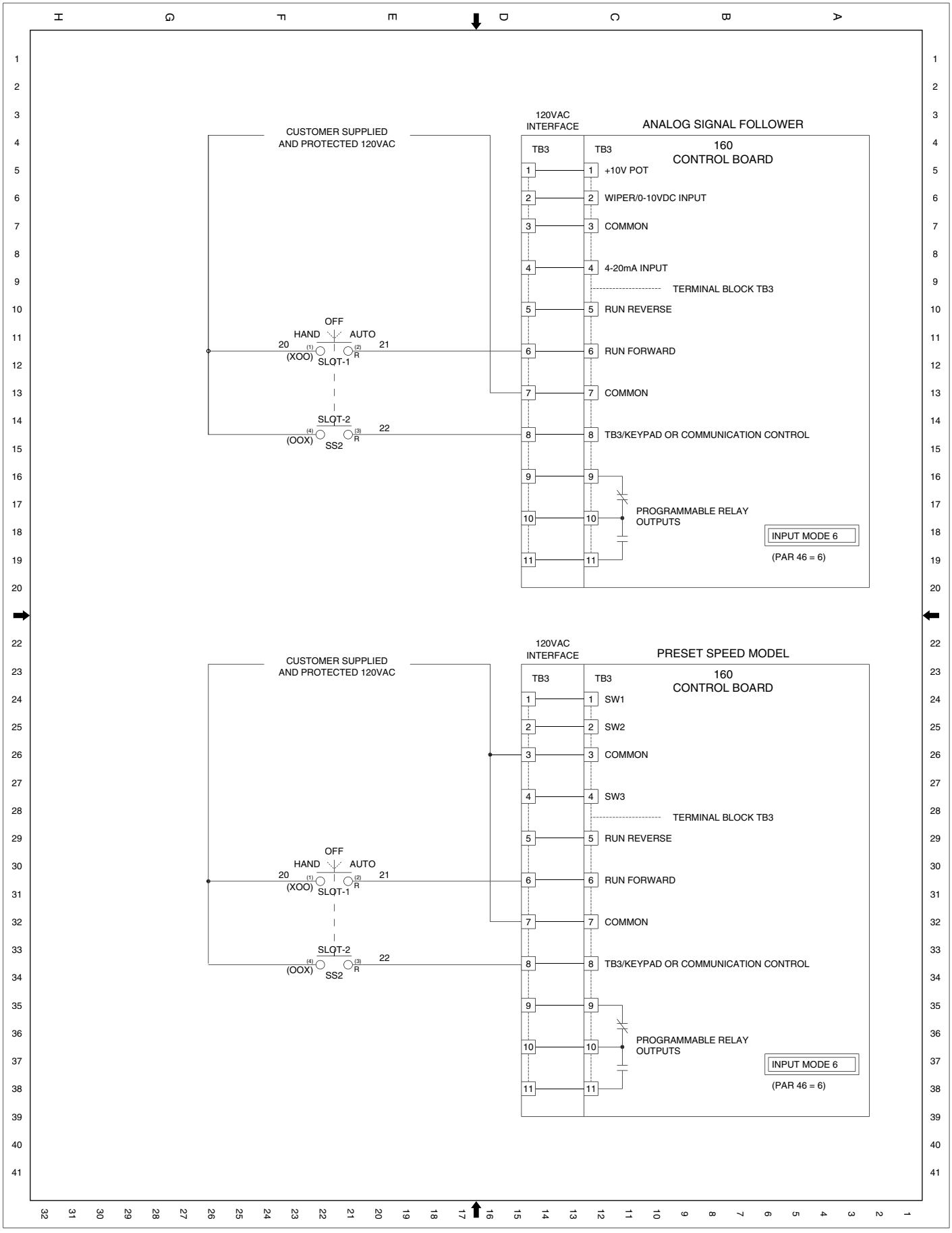
DRIVE RATINGS			FUSE RATINGS (DS OPTION)		
CATALOG NO.	VOLTAGE	FLA	TYPE	AMP	VOLT
160S-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V
160S-AA03* (.75)	200-240V	3.0A	LPJ	10A	600V
160S-AA04* (1)	200-240V	4.5A	LPJ	15A	600V
160S-AA08* (2)	200-240V	8.0A	LPJ	30A	600V

THREE PHASE

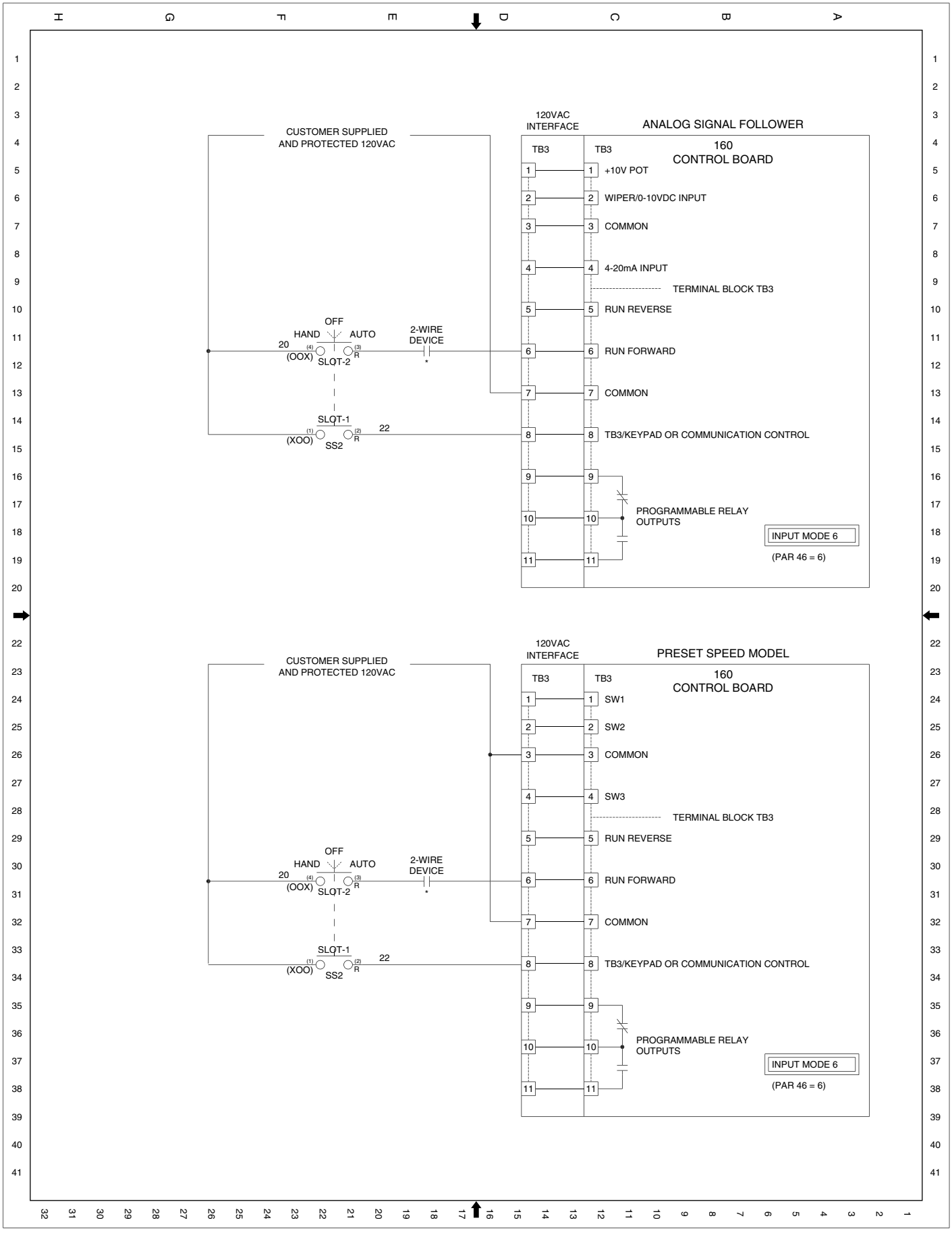
DRIVE RATINGS			FUSE RATINGS (DS OPTION)		
CATALOG NO.	VOLTAGE	FLA	TYPE	AMP	VOLT
160-AA02* (.5)	200-240V	2.3A	LPJ	6A	600V
160-AA03* (.75)	200-240V	3.0A	LPJ	6A	600V
160-AA04* (1)	200-240V	4.5A	LPJ	10A	600V
160-AA08* (2)	200-240V	8.0A	LPJ	15A	600V
160-AA12* (3)	200-240V	12.0A	LPJ	20A	600V
160-AA18* (5)	200-240V	18.0A	LPJ	30A	600V
160-BA01* (.5)	380-460V	1.2A	LPJ	4A	600V
160-BA02* (.75)	380-460V	1.7A	LPJ	4A	600V
160-BA03* (1)	380-460V	2.3A	LPJ	5A	600V
160-BA04* (2)	380-460V	4.0A	LPJ	8A	600V
160-BA06* (3)	380-460V	6.0A	LPJ	15A	600V
160-BA10* (5)	380-460V	10.5A	LPJ	20A	600V

* - CATALOG NO. SUFFIX CAN CONTAIN "SF1" OR "PS1"

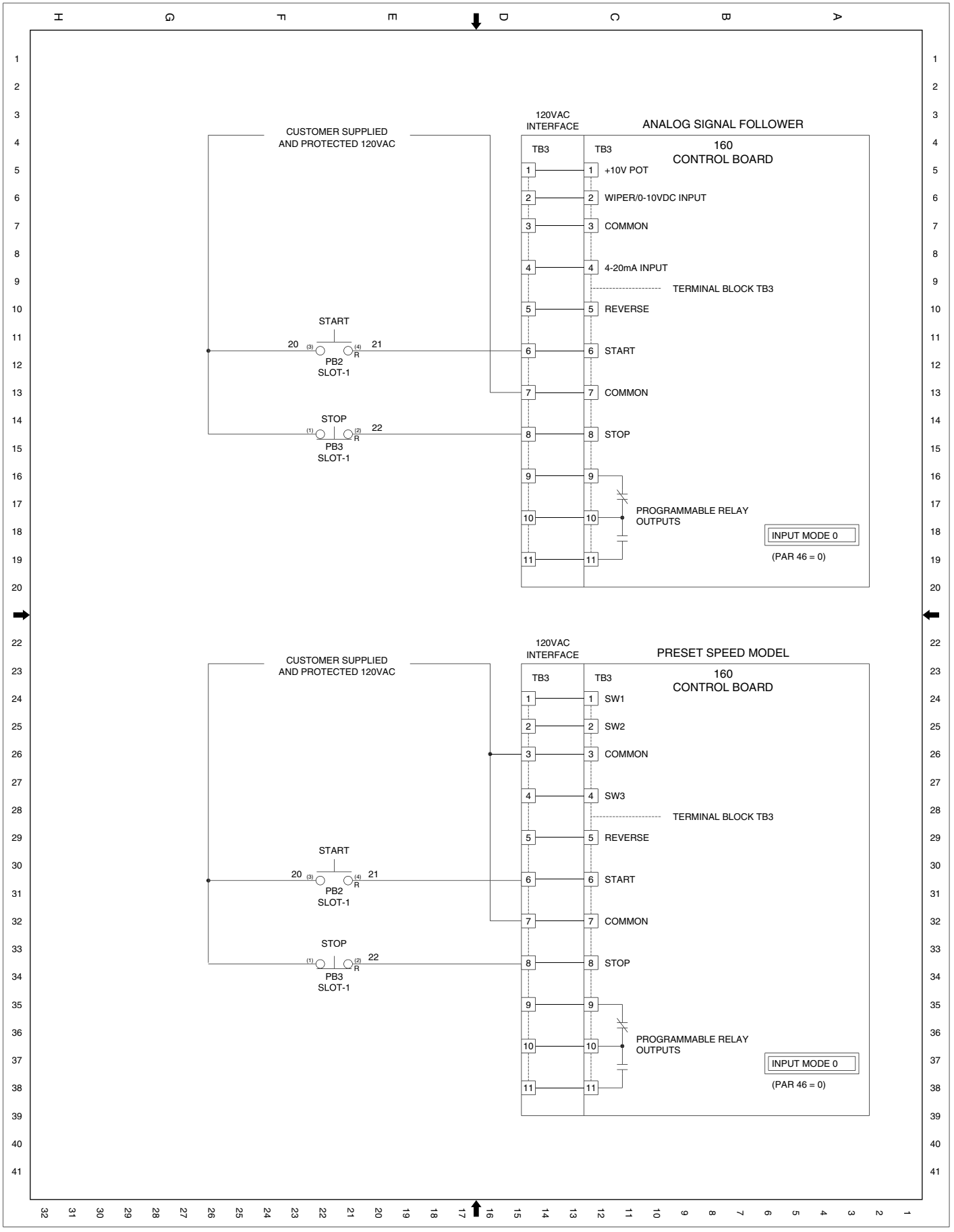
D13 Without P2C



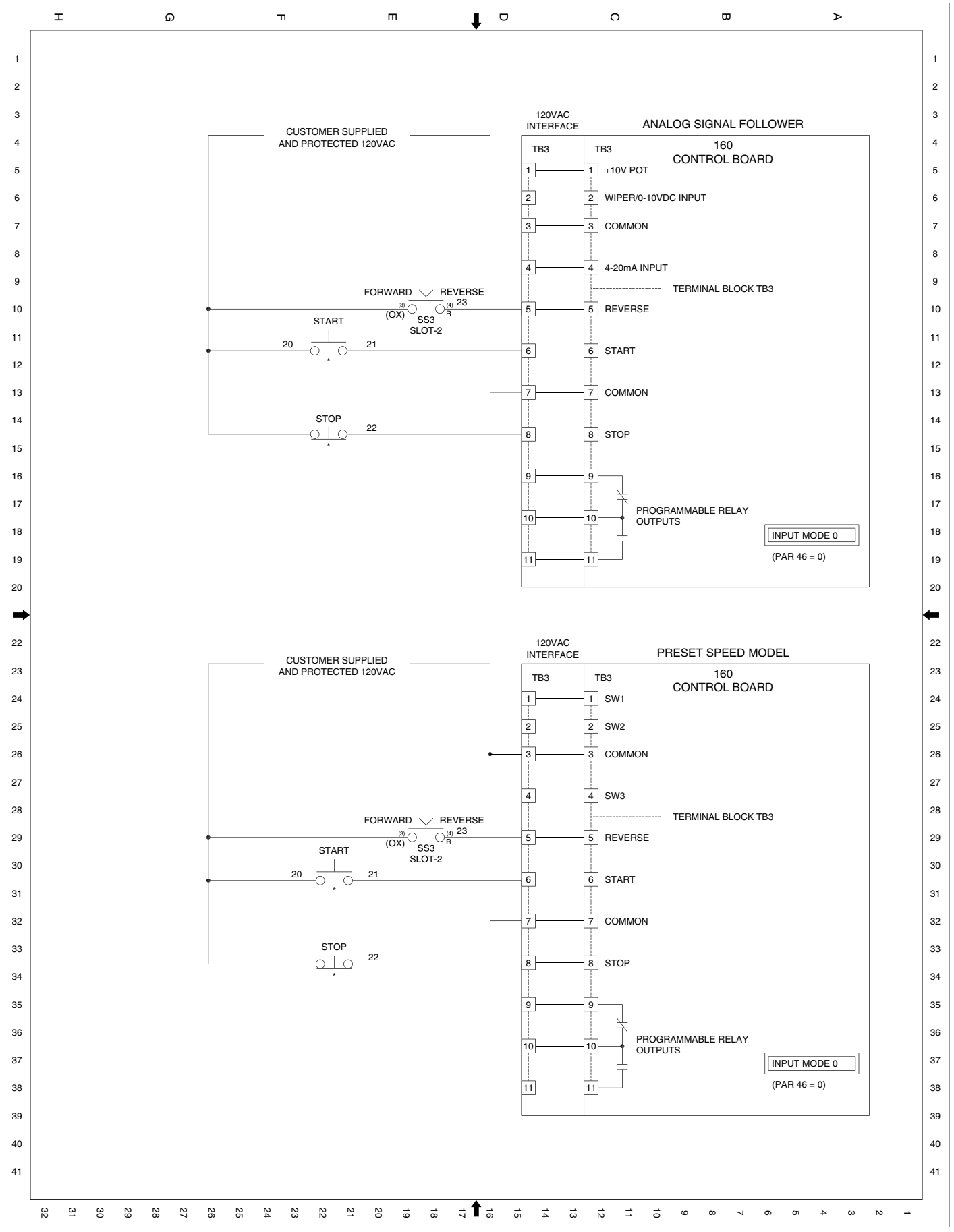
D13 With P2C


CUSTOMER SUPPLIED
AND PROTECTED 120VAC
120VAC
INTERFACE
ANALOG SIGNAL FOLLOWER
TB3
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY
OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
OFF
HAND
AUTO
20
(OOX)
SLOT-2
2-WIRE
DEVICE
SLOT-1
22
(XOO)
SS2
CUSTOMER SUPPLIED
AND PROTECTED 120VAC
120VAC
INTERFACE
PRESET SPEED MODEL
TB3
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY
OUTPUTS
INPUT MODE 6
(PAR 46 = 6)

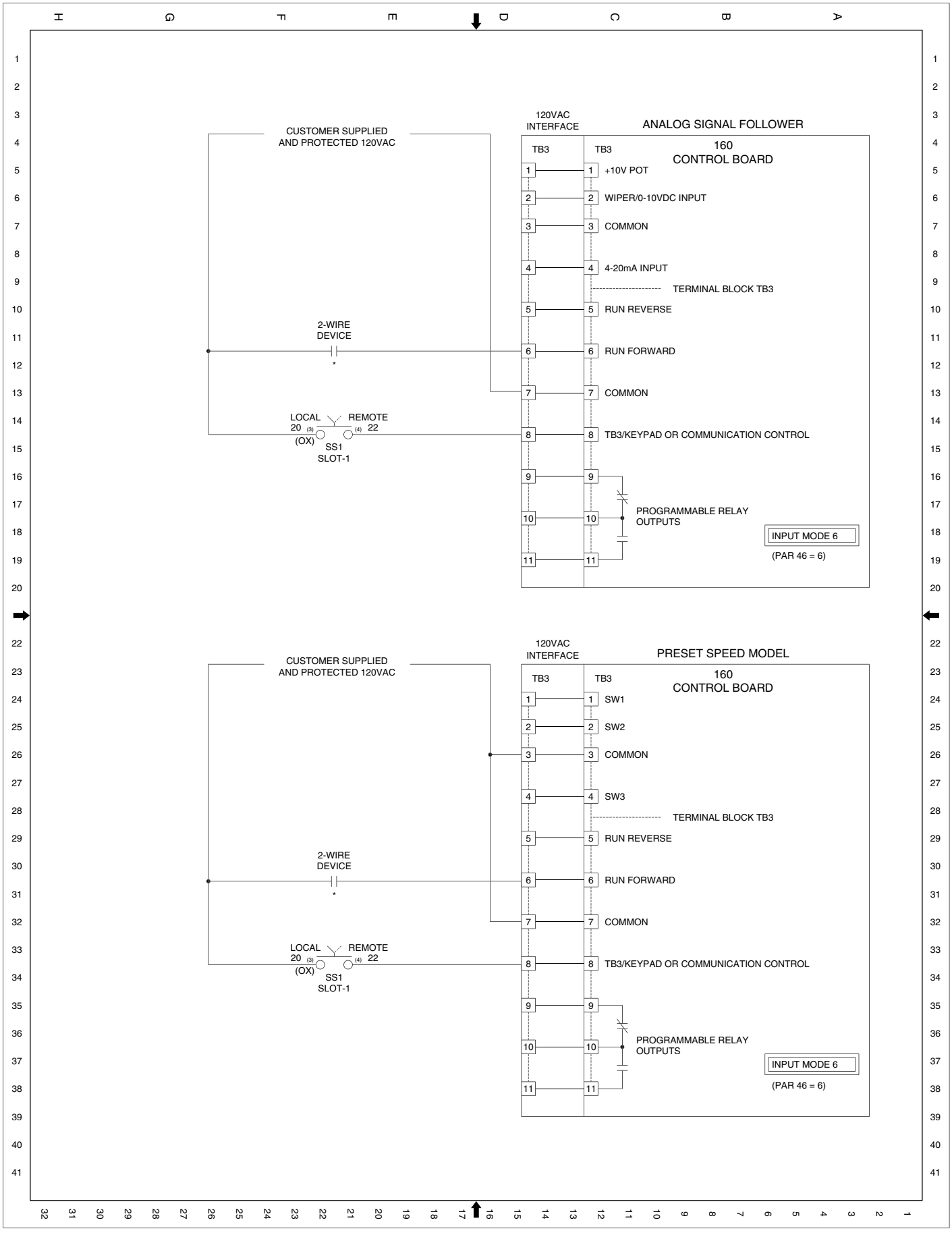
D17


120VAC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
START
20 (3) (4) R 21
PB2 SLOT-1
STOP
(1) (2) R 22
PB3 SLOT-1
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
120VAC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
START
20 (3) (4) R 21
PB2 SLOT-1
STOP
(1) (2) R 22
PB3 SLOT-1
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 0
(PAR 46 = 0)

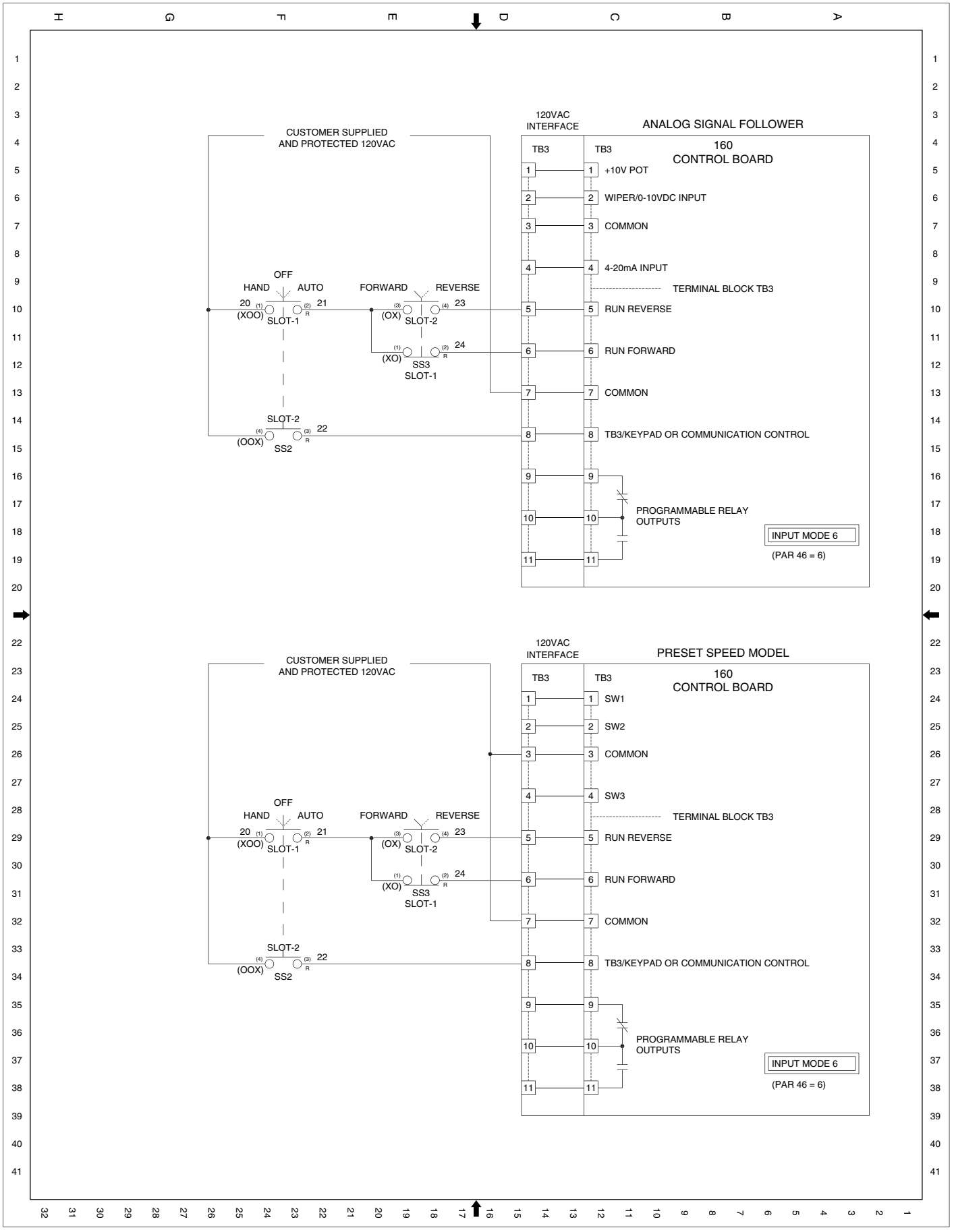
D32


120VAC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10 PROGRAMMABLE RELAY OUTPUTS
11
FORWARD
REVERSE
(3) (OX)
(4) R
23
SS3 SLOT-2
START
20
21
STOP
22
INPUT MODE 0
(PAR 46 = 0)
120VAC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10 PROGRAMMABLE RELAY OUTPUTS
11
FORWARD
REVERSE
(3) (OX)
(4) R
23
SS3 SLOT-2
START
20
21
STOP
22
INPUT MODE 0
(PAR 46 = 0)

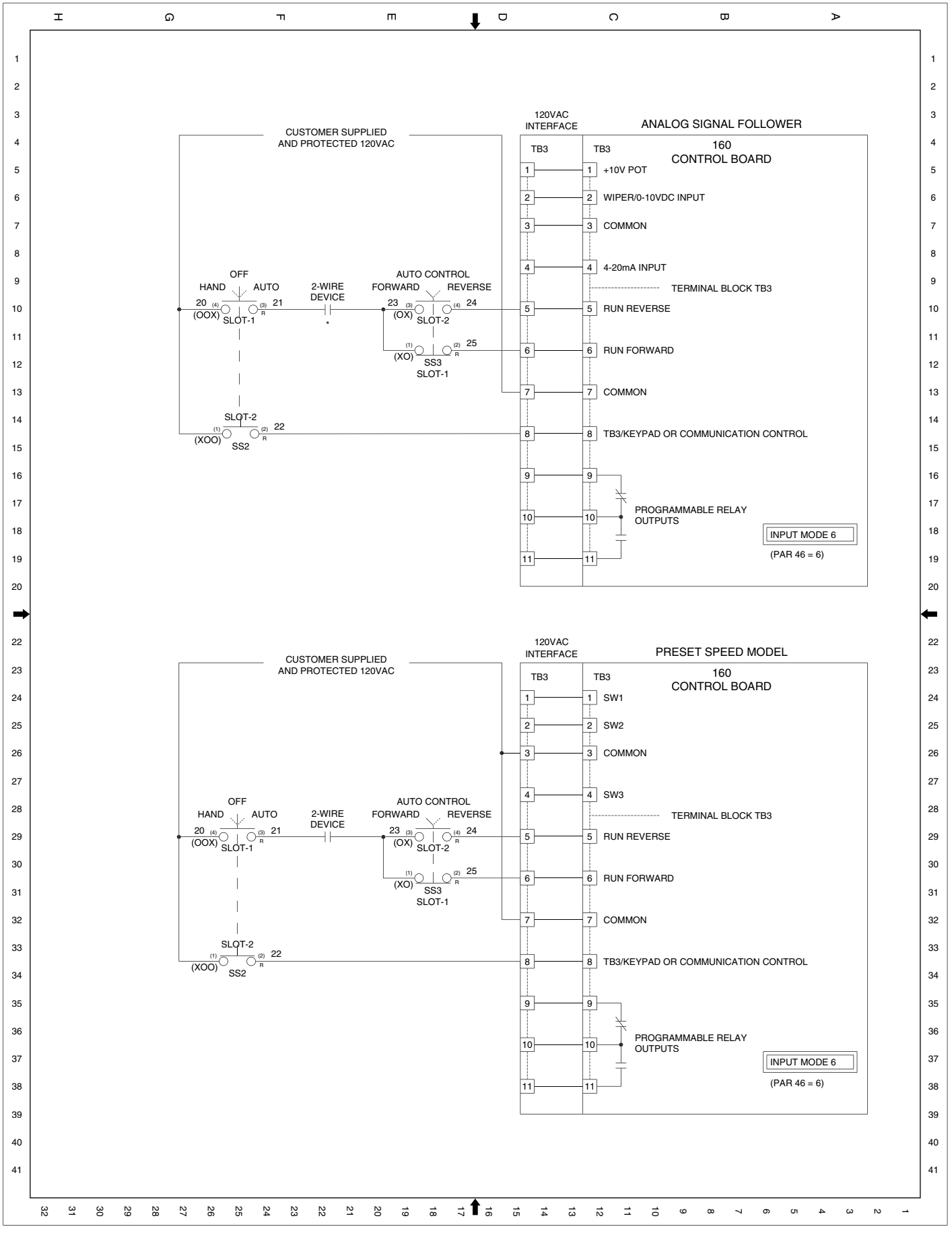
D33


120VAC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
2-WIRE DEVICE
*
LOCAL
REMOTE
20 (3)
(4) 22
(OX)
SS1
SLOT-1
INPUT MODE 6
(PAR 46 = 6)
120VAC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
2-WIRE DEVICE
*
LOCAL
REMOTE
20 (3)
(4) 22
(OX)
SS1
SLOT-1
INPUT MODE 6
(PAR 46 = 6)

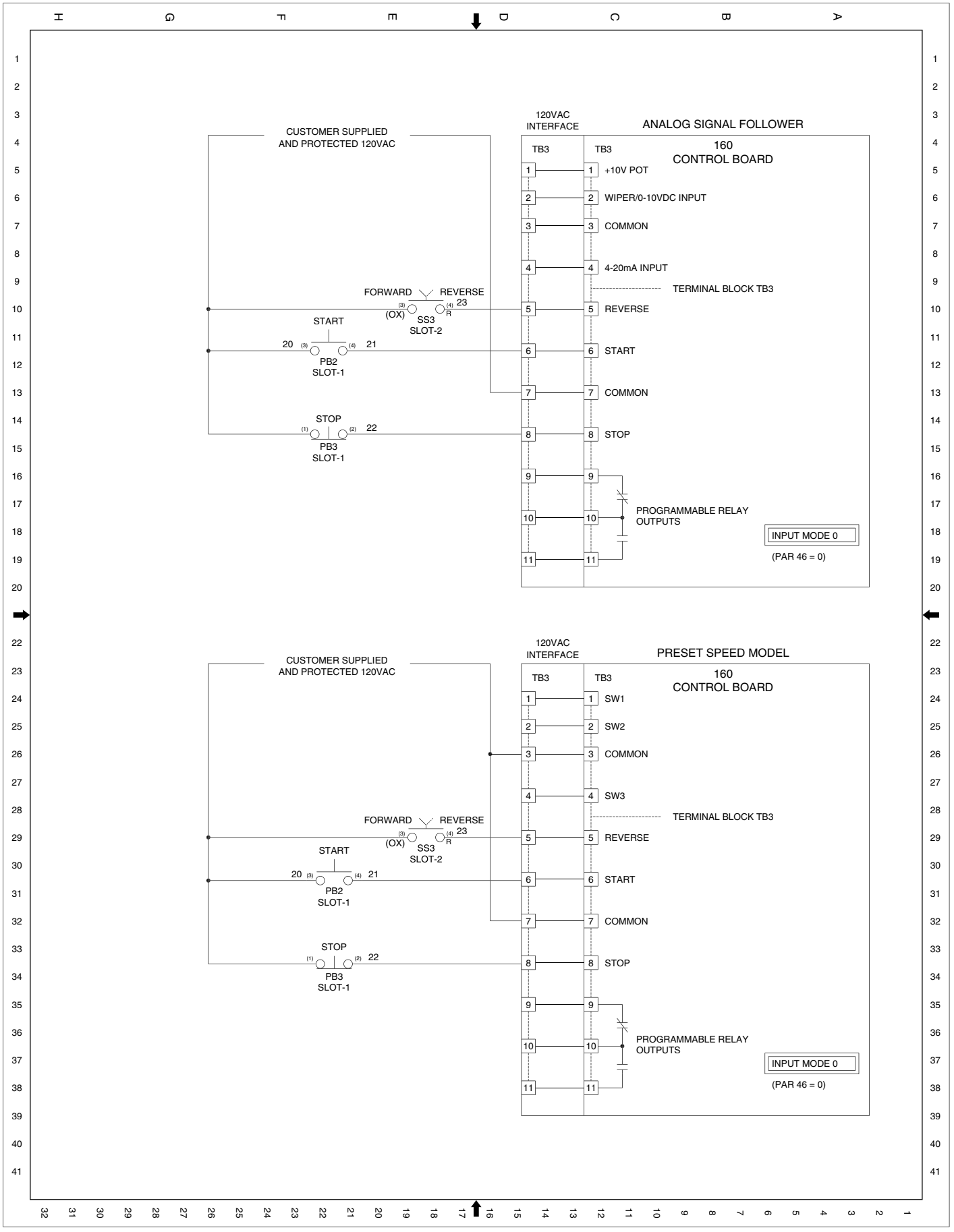
D13 and D32 Without P2C



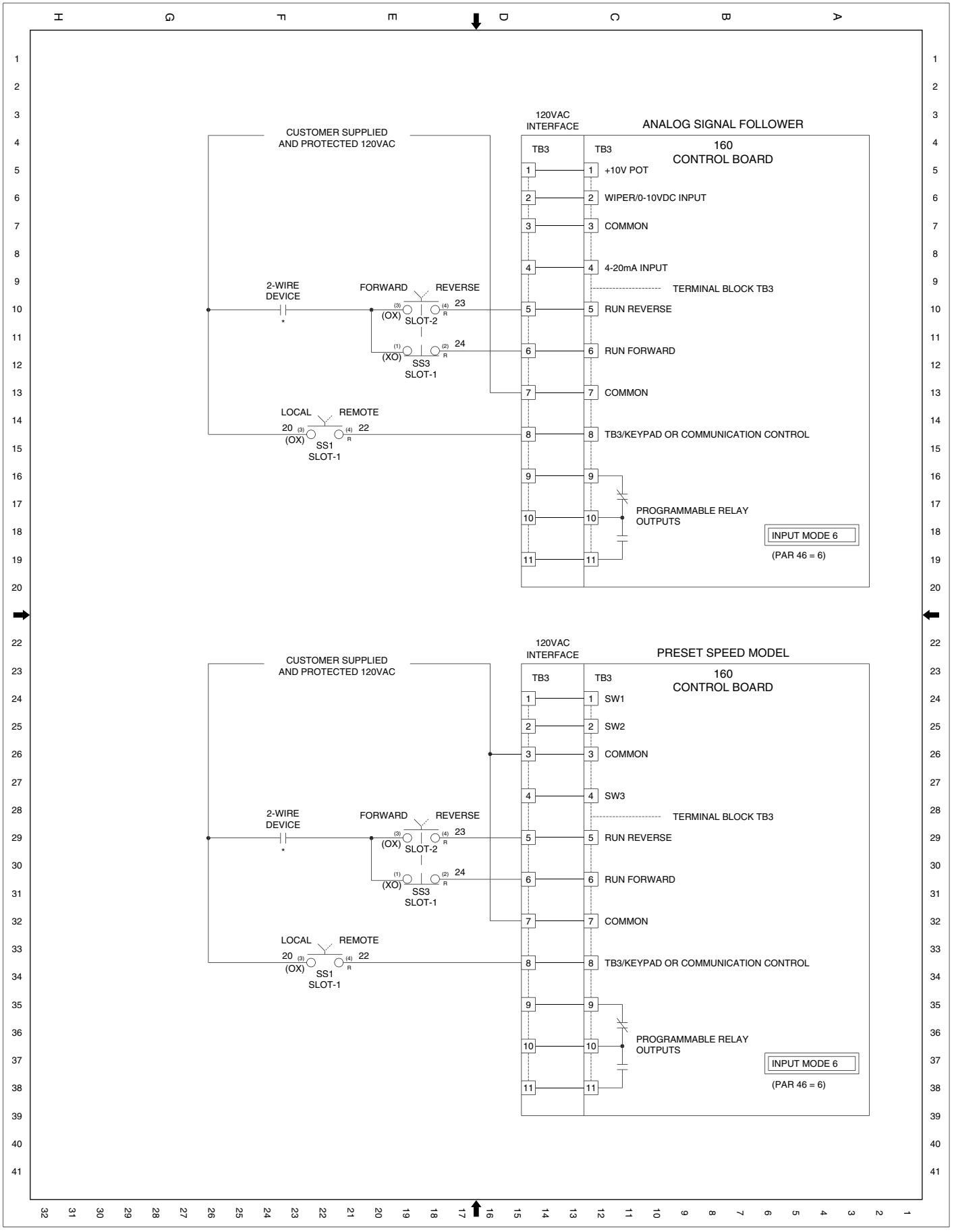
D13 and D32 With P2C



D17 and D32


CUSTOMER SUPPLIED
AND PROTECTED 120VAC
120VAC
INTERFACE
ANALOG SIGNAL FOLLOWER
TB3
TB3
160
CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY
OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
FORWARD
REVERSE
(OX)
SS3
SLOT-2
23
START
20
21
PB2
SLOT-1
STOP
22
PB3
SLOT-1
CUSTOMER SUPPLIED
AND PROTECTED 120VAC
120VAC
INTERFACE
PRESET SPEED MODEL
TB3
TB3
160
CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 REVERSE
6 START
7 COMMON
8 STOP
9
10
11
PROGRAMMABLE RELAY
OUTPUTS
INPUT MODE 0
(PAR 46 = 0)
FORWARD
REVERSE
(OX)
SS3
SLOT-2
23
START
20
21
PB2
SLOT-1
STOP
22
PB3
SLOT-1

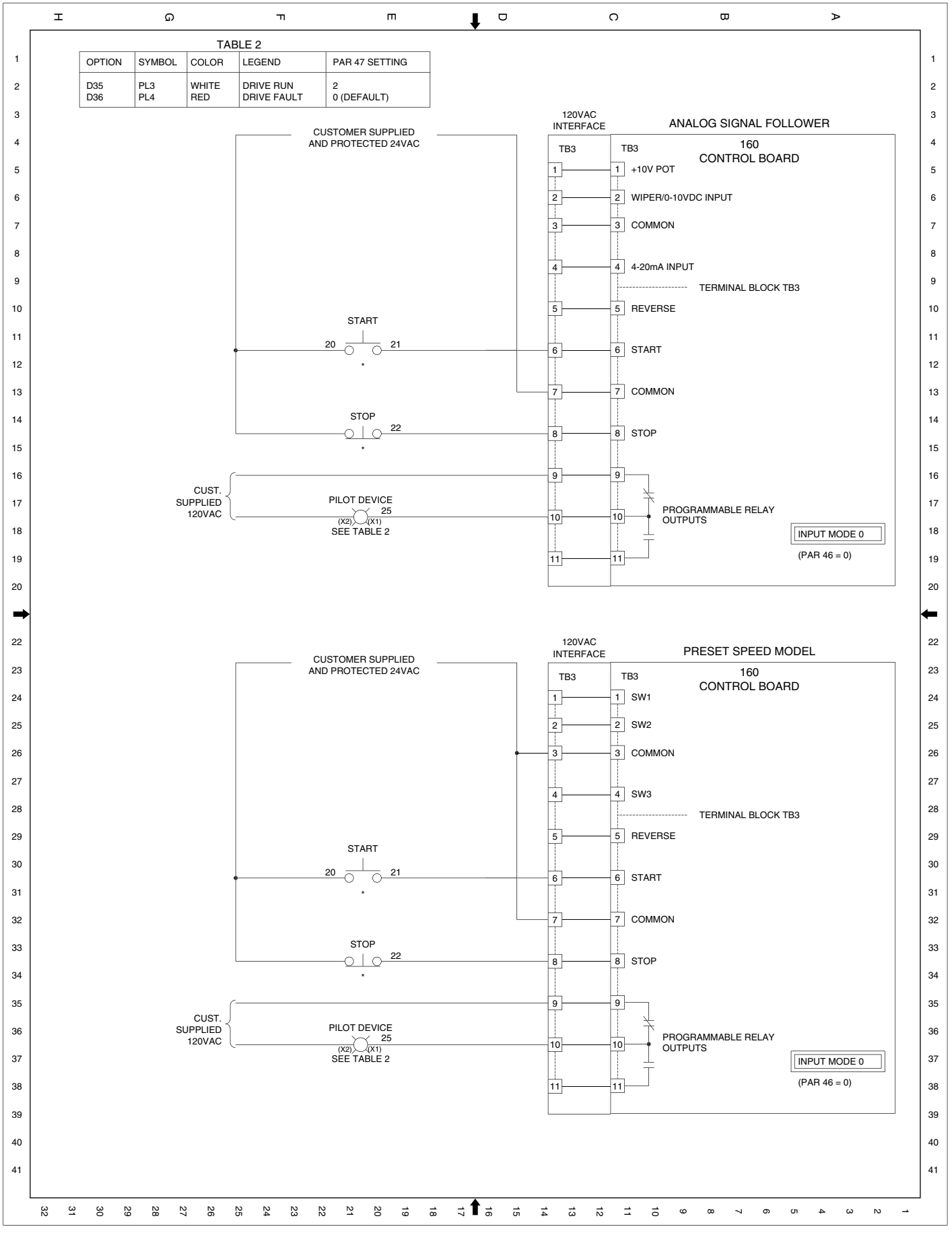
D32 and D33


120VAC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
2-WIRE DEVICE
FORWARD
REVERSE
23
24
(OX)
(XO)
SLOT-2
SS3
SLOT-1
LOCAL
REMOTE
20
22
SS1
SLOT-1
120VAC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)

D35 and D36 Without Keypad or Comm Control Options

TABLE 2

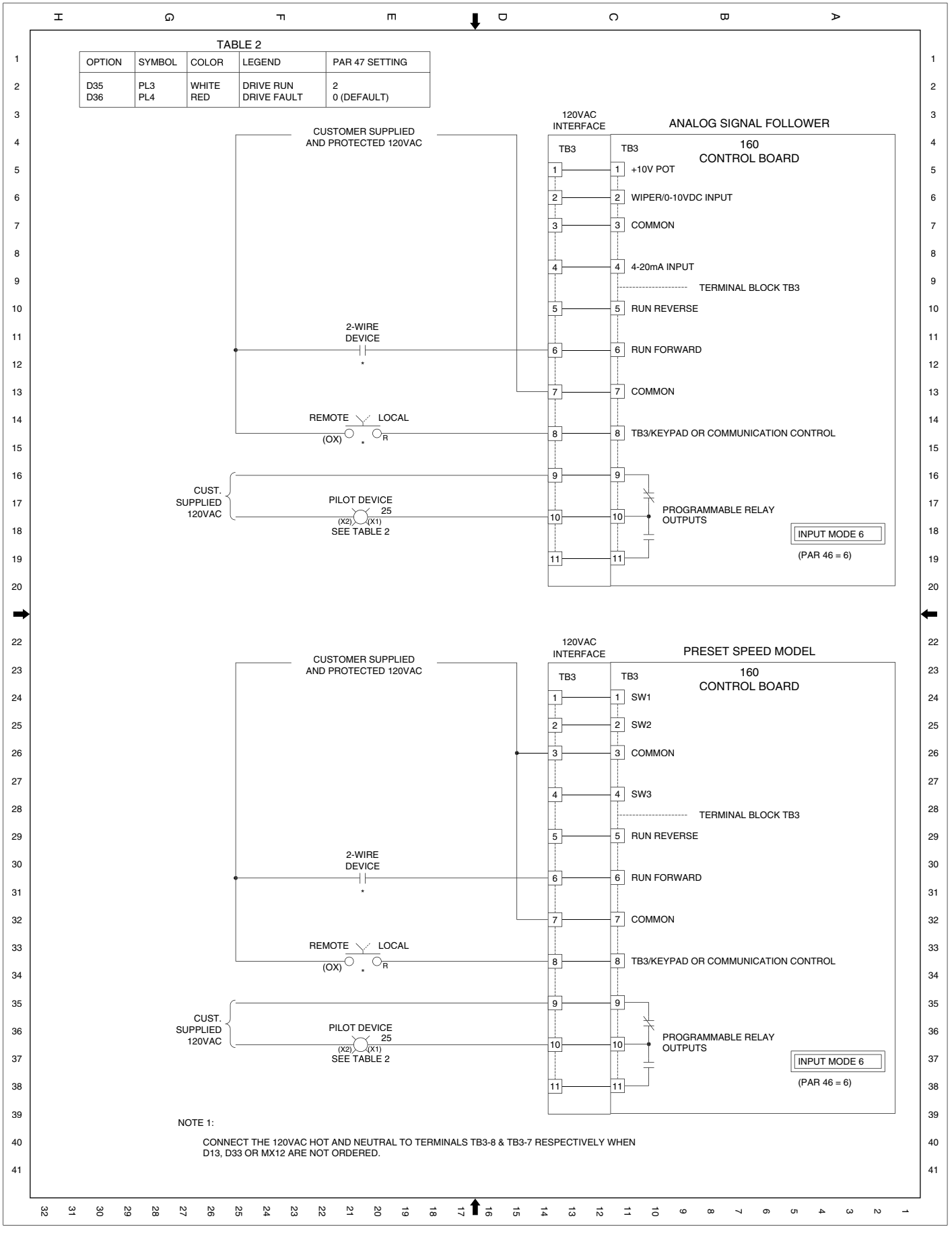
OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)



D35 and D36 With Keypad or Comm Control Options

TABLE 2

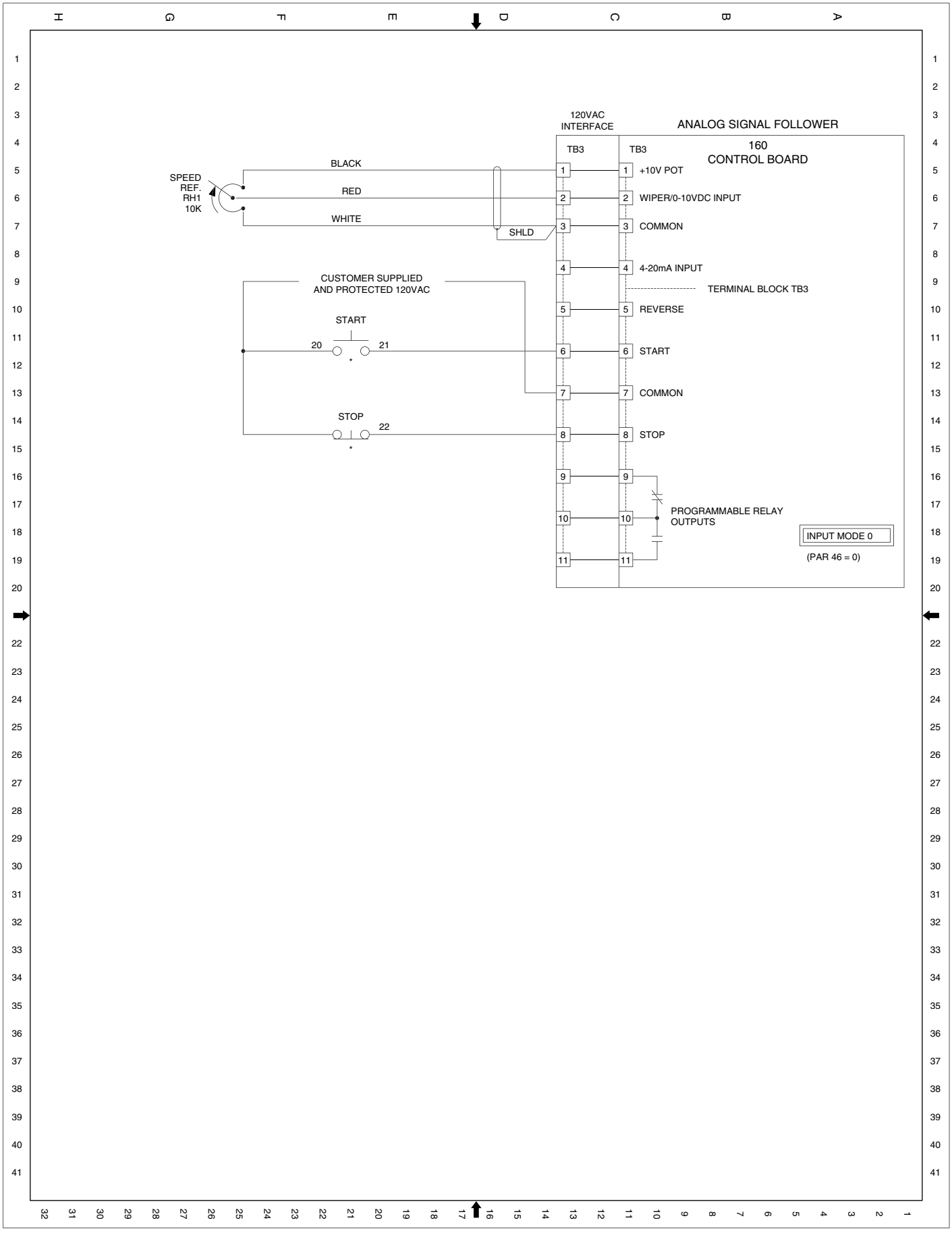
OPTION	SYMBOL	COLOR	LEGEND	PAR 47 SETTING
D35 D36	PL3 PL4	WHITE RED	DRIVE RUN DRIVE FAULT	2 0 (DEFAULT)



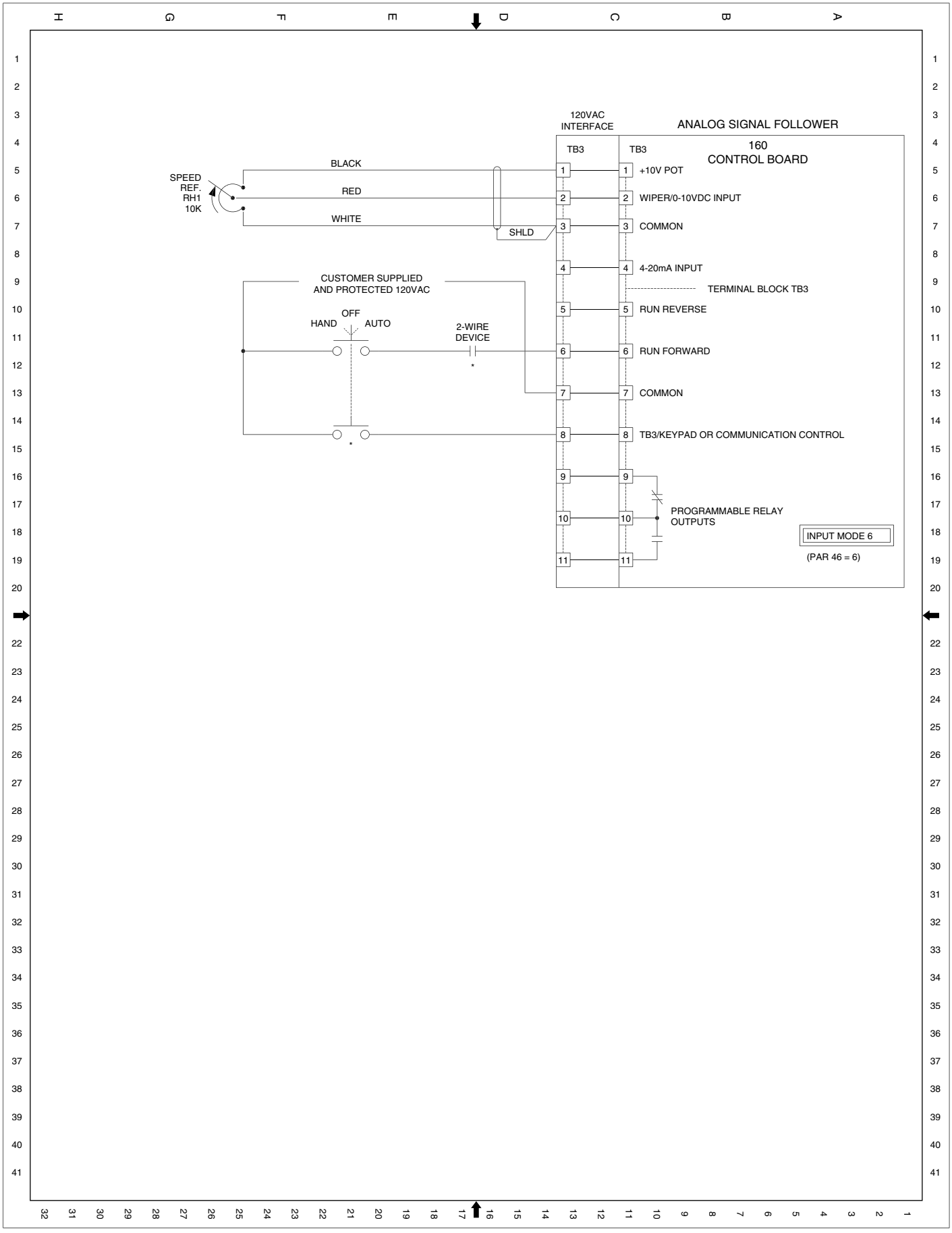
NOTE 1:

CONNECT THE 120VAC HOT AND NEUTRAL TO TERMINALS TB3-8 & TB3-7 RESPECTIVELY WHEN D13, D33 OR MX12 ARE NOT ORDERED.

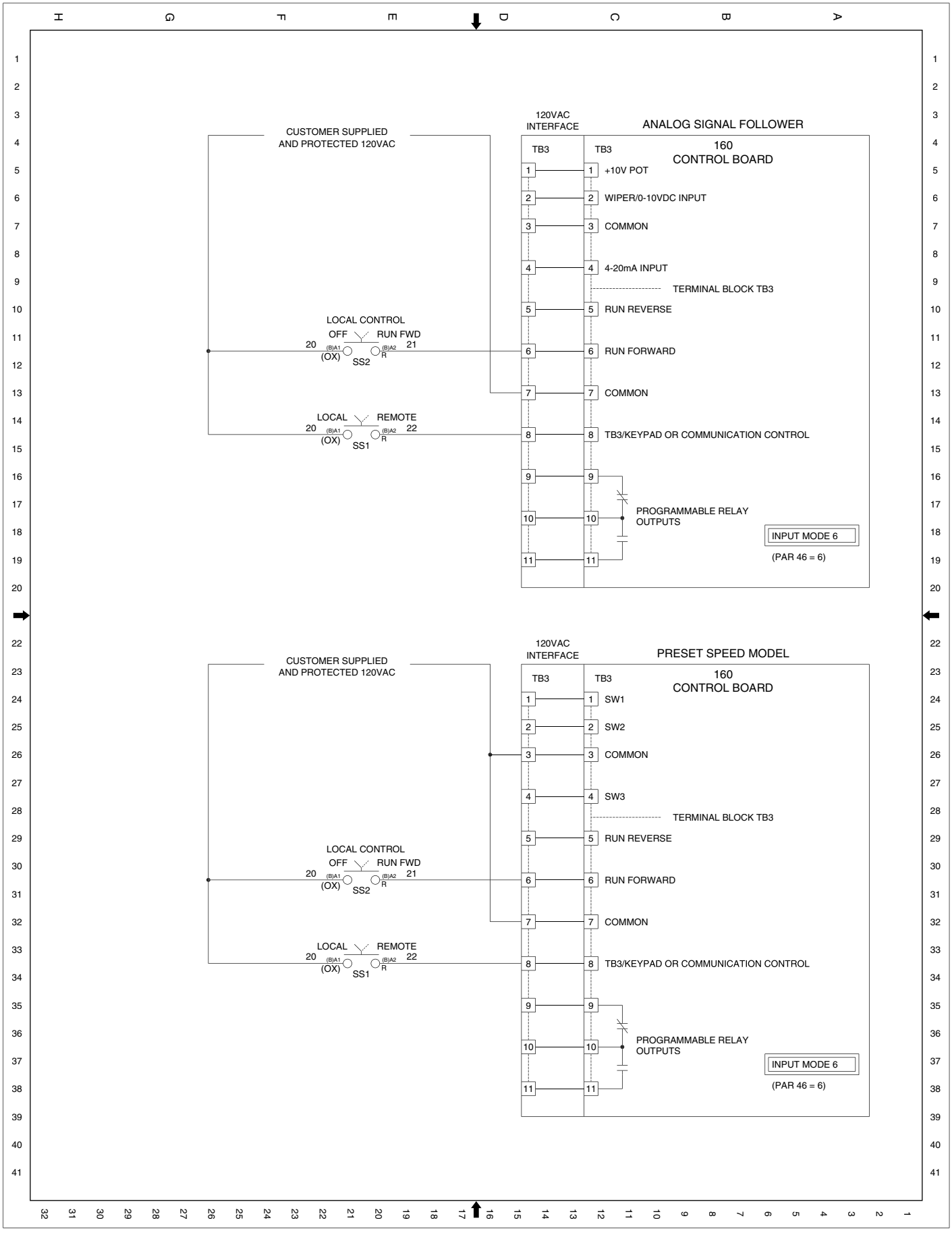
D61 for Analog Signal Follower Drives Without Keypad or Comm Control Options



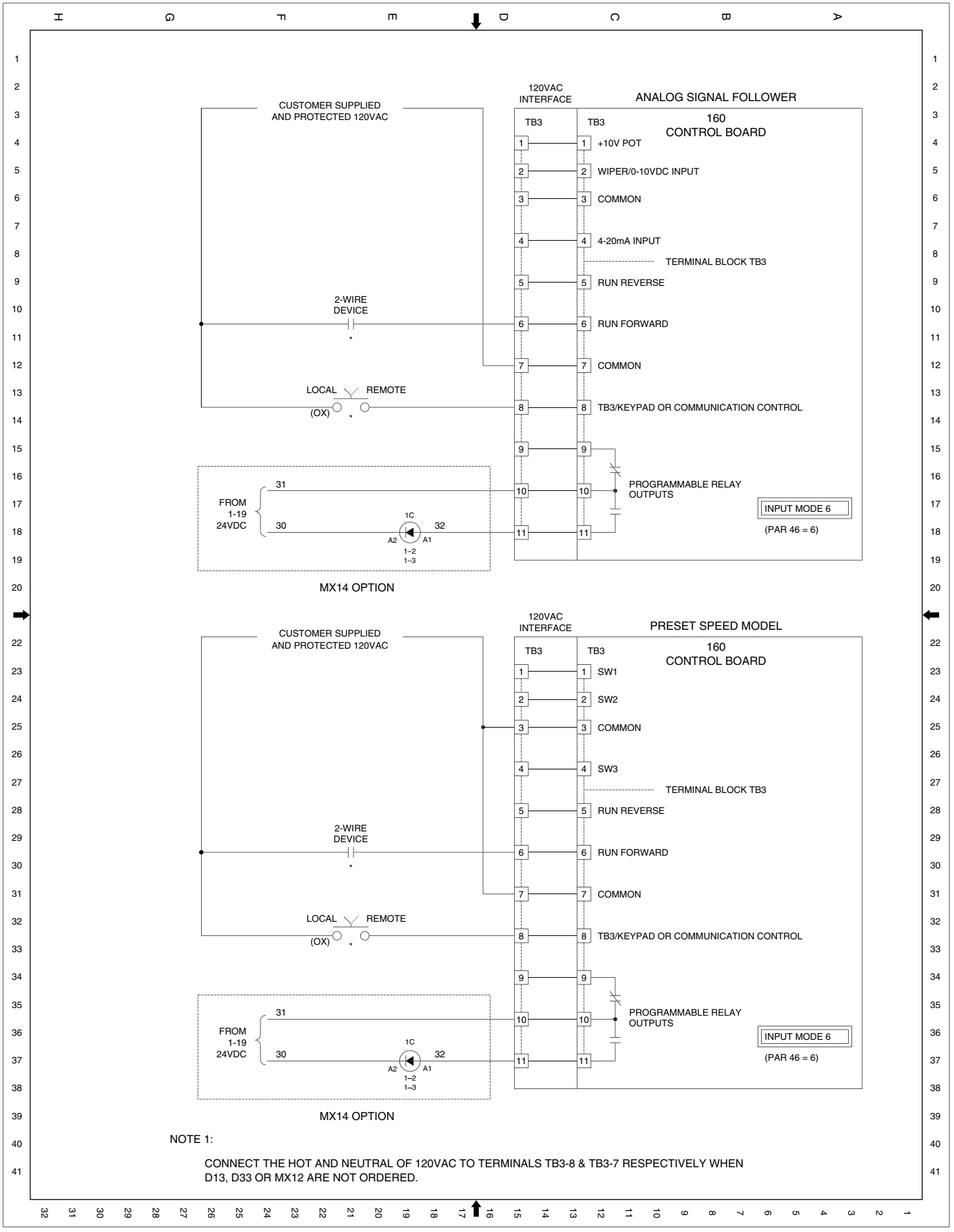
D61 for Analog Signal Follower Drives With Keypad or Comm Control Options



MX12


120VAC INTERFACE
ANALOG SIGNAL FOLLOWER
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 +10V POT
2 WIPER/0-10VDC INPUT
3 COMMON
4 4-20mA INPUT
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20
21
(B)A1
(B)A2
(OX)
R
SS2
LOCAL
REMOTE
22
SS1
120VAC INTERFACE
PRESET SPEED MODEL
CUSTOMER SUPPLIED AND PROTECTED 120VAC
TB3
TB3
160 CONTROL BOARD
1 SW1
2 SW2
3 COMMON
4 SW3
TERMINAL BLOCK TB3
5 RUN REVERSE
6 RUN FORWARD
7 COMMON
8 TB3/KEYPAD OR COMMUNICATION CONTROL
9
10
11
PROGRAMMABLE RELAY OUTPUTS
INPUT MODE 6
(PAR 46 = 6)
LOCAL CONTROL
OFF
RUN FWD
20
21
(B)A1
(B)A2
(OX)
R
SS2
LOCAL
REMOTE
22
SS1

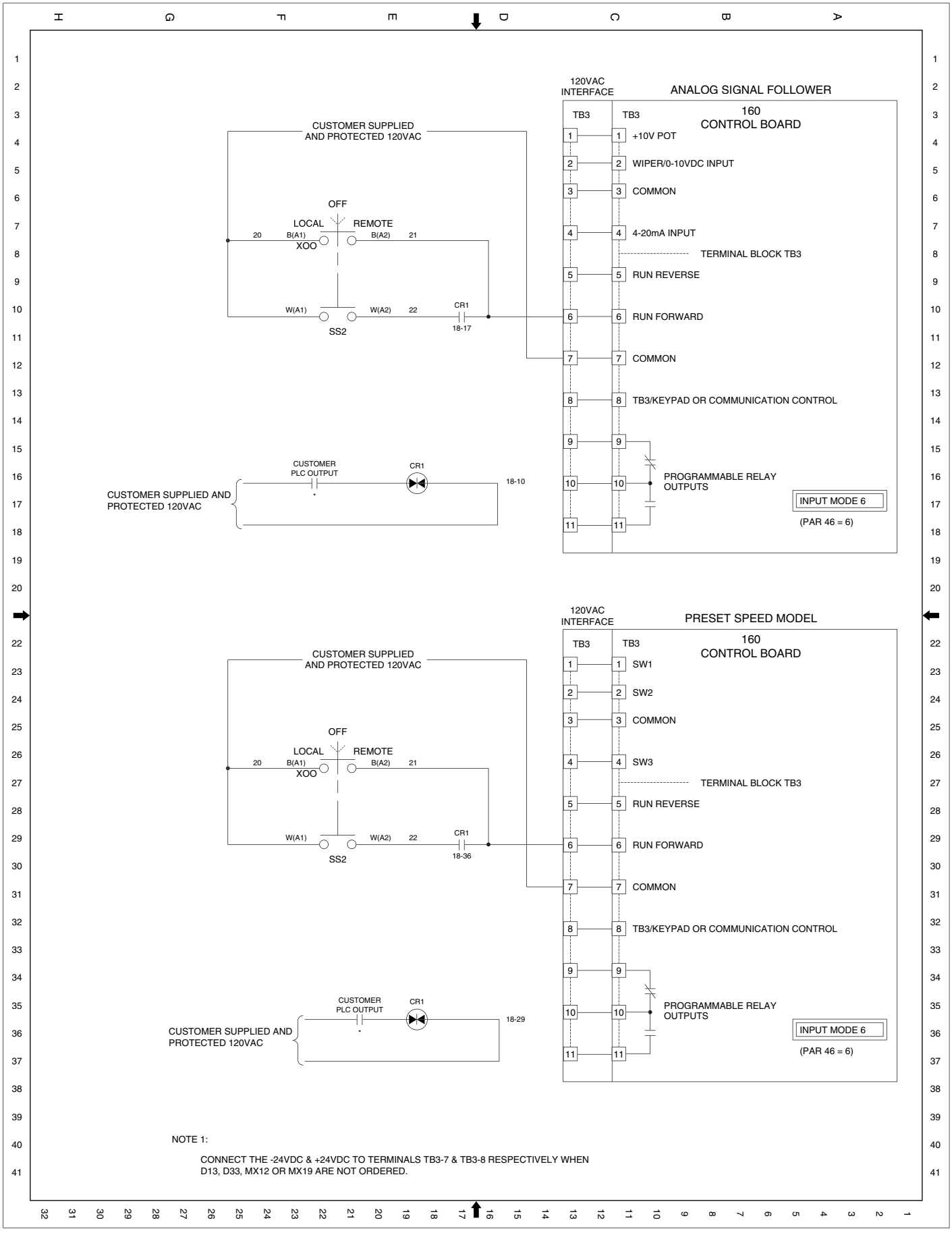
MX14



NOTE 1:

CONNECT THE HOT AND NEUTRAL OF 120VAC TO TERMINALS TB3-8 & TB3-7 RESPECTIVELY WHEN D13, D33 OR MX12 ARE NOT ORDERED.

MX19



NOTE 1:

CONNECT THE -24VDC & +24VDC TO TERMINALS TB3-7 & TB3-8 RESPECTIVELY WHEN D13, D33, MX12 OR MX19 ARE NOT ORDERED.

Material List for Spare Parts

MATERIAL LIST – COMPONENTS

	DESCRIPTION	A-B PART NO.	MANUFACTURER/PART NO.	
EA1	DRIVE UNIT	N/A	REFER TO C-300316-12 FOR DRIVE CATALOG NO.	
F1-3	FUSES	N/A	BUSSMANN/LPJ-*SP (NOTE 1)	
DS	DISCONNECT	N/A	AB/194R-NJ030P3	
RF1	LINE FILTER	N/A	REFER TO C-300356-2, PAGE 2, TABLE 1 FOR CATALOG NO.	
P1	PROG. KEYPAD	N/A	AB/160-P1	
P2	OP INTRF MOD	N/A	AB/160-P2	
DN2	DEVICENET MOD.	N/A	AB/160-DN2	
RS1	SER. COM. MOD.	N/A	AB/160-RS1	
DMPS1	24V PRESET INTRFCE	N/A	AB/160-DM-PS1	
DMSF1	24V ANAL. INTRFCE	N/A	AB/160-DM-SF1	
LTN120	115V INTERFACE (SF)	N/A	LEAF TECHNOLOGY/LT160-SF1-120VAC	
LTN120	115V INTERFACE (PS)	N/A	LEAF TECHNOLOGY/LT160-PS1-120VAC	
SS1	LOCAL/REMOTE SS	N/A	AB/800EP-SM24LX10	
SS2	H O A SEL SW	N/A	AB/800EP-SM32C24LX22	
SS3	FOR/REV SS	N/A	AB/800EP-SM24LX10	
PB2	START PB	N/A	AB/800EP-F34LX10	
PB3	STOP PB	N/A	AB/800EP-F44LX01	
PL3	PILOT LIGHT, WHITE	N/A	AB/800EP-PL74RL5	
PL4	PILOT LIGHT, RED	N/A	AB/800EP-PL44RL5	
RH1	FREQ POT	119331	OHMITE CMU1031	
1C	CONTACTOR	N/A	AB/100-M05NZ243	
IB1	INTERBUS MODULE	N/A	AB/160-IB1	
PD1	PROFIBUS MODULE	N/A	AB/160-PD1	
DNR	DEVICENET I/O RELAY	N/A	AB/100-DNY42R	
SS1	LOCAL/REMOTE SS	N/A	AB/800EP-SM24LX10	MX12 OPTION ONLY
SS2	OFF/RUN FWD SS	N/A	AB/800T-H2A	
SS2	LOCAL-OFF-REMOTE SS	N/A	AB/800T-J2A	MX19 OPTION ONLY
CR1	RELAY	N/A	AB/700-HA32A1	

GENERAL NOTES:

1. SEE TABLE 1 FOR FUSE SIZES.

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